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HIGH PRICES FOR STEEL SHIPS.

SALE OF THE WOLVIN FLEET—STRUGGLE FOR SUPREMACY AMONG THE BIG STEEL COMBINATIONS IS CAUSING FURTHER CONCENTRATION OF LAKE INTERESTS—THE FREIGHT OUTLOOK.

The lake vessel owner, alike to everybody connected with the iron and steel industry, is not surprised at anything he may hear these days regarding big transactions in transportation lines. For several days past all manner of reports have been circulated regarding the efforts of the Federal Steel Co., the American Steel & Wire Co. and the Carnegie Steel Co. to purchase modern steel vessels for the ore trade. The struggle for supremacy between these large concerns will certainly bring about a further concentration of lake interests. Just now the ship yards are working on new vessels that will tax their facilities until well into the close of the coming season. If such was not the case, the builders would find no difficulty in filling up on orders from the big steel interests. The boom, therefore, in shipping lines is in vessels on the stocks or the few modern steel carriers already in commission that may be purchased from owners who have no connection with concerns that are both miners and consumers of iron ore.

The most important announcement in this regard is the sale of two steel steamers, Pennsylvania and Texas, building at the works of the Cleveland Ship Building Co., Lorain, for A. B. Wolvin and others. The ownership of these vessels has been transferred to the office of Pickands, Mather & Co., Cleveland, but whether for the Federal Steel Co. or for other interests represented in that office is not definitely known as yet. These vessels were probably not sold for less than \$275,000 each, a price that represents a very great margin over the figures at which contracts for them were made by Mr. Wolvin a few months ago. It is also more than probable that within the next few days announcement will be made of the sale to the Federal Steel Co. of the five other steel steamers of the Wolvin fleet that are known as the Zenith Transit Co. ships. This sale is understood to be already as good as closed. Mr. Wolvin has been at work on the matter in New York for several days past. The steamers are the Zenith City, Queen City, Superior City, Crescent City and Empire City, all of them big carriers and modern in every way, with a combined value of probably a million and a quarter. The American Steel & Wire Co. has been negotiating for some time past for steel vessels to be added to the fleet which they secured in absorbing the Cleveland Rolling Mill Co., and it has been said that the Carnegie company was bidding against the Federal Steel for the Wolvin fleet, but there is nothing official about this latter report. It is the general opinion, however, that conditions like those now prevailing will force the Carnegie company to undertake on its own account the transportation of that part of its ore (a very large proportion) that is not provided for by contract with John D. Rockefeller. The sale of the Wolvin fleet undoubtedly means that Mr. Wolvin is to leave the lakes and take up for James J. Hill of the Great Northern railway the establishment of a line of ships to the Orient from the terminals of the Great Northern on the Pacific coast.

The result of all this effort on the part of the big steel combinations to provide for the transportation of their ore during the coming season is, of course, additional strength in the lake freight market and regret on the part of the vessel owners that their tonnage is so largely tied up to the low ore contracts, based on 60 cents from the head of Lake Superior. There is nothing doing in the way of additional lake freight contracts. Practically all of the vessels that are available for ore contracts at anything like the prices that shippers would pay are tied up in one way or another, and although it is claimed that 70 cents could be secured for desirable tonnage for the full season, there is nothing in the way of negotiations on which to base such a statement. Ore shippers all claim that they will be so crowded in caring for contract tonnage that the wild rates will be held close to the contract figure throughout the greater part of the season, but this statement seems to have little effect on the vessel owner, on account of the large business that is expected in grain, coal, lumber and other lines. The grain freight situation is a little quiet now at Duluth, but vessel owners have refused 2½ cents for first trips with wheat from Duluth to Buffalo, and they all seem disposed to avoid coal contracts at any price. At this time a year ago big blocks of coal, 100,000 ton lots in some cases, were taken to be moved from Lake Erie ports to the head of Lake Superior, at 20 cents a ton. Now 30 cents a ton is talked of and there is considerable doubt as to whether very much could be covered, even at that figure. In their efforts to provide for the movement of coal to Milwaukee and other Lake Michigan ports, shippers are meeting with rates even higher in proportion than those talked of to Lake Superior, and so there are no contracts being made and little indication, for the present at least, of the two interests agreeing on rates. On the large amount of coal that goes to the Portage lake district rates will undoubtedly be unusually high, as the number of small vessels available for that trade is getting smaller every day. In this same connection it may be noted that some of the lumber companies are looking to the purchase of small vessels for their special requirements.

A correspondent of the Marine Review at Belfast, Ireland, writes that Harland & Wolff intend to this month make an advance in the wages paid to iron shipwrights and boiler makers. The advance will amount to 2½ per cent. on piece-work rates and an increase of \$1.50 per week on the wages of laborers. The effect will be, it is believed, to make the minimum wage of laborers \$4.62 per week, and of platers' helpers \$8.00 and \$8.20 according to their grades.

PROPOSED BUFFALO-DETROIT LINE.

TWO SIDE-WHEEL STEAMERS TO COST ABOUT \$550,000 EACH—ONE IMPORTANT PART OF THE FINANCES ALREADY PROVIDED FOR.

The proposed Buffalo-Detroit line of side-wheel passenger and freight steamers for night service, similar to that now afforded between Buffalo and Cleveland, and Detroit and Cleveland, is not one of the numerous schemes on paper that are heard of these days. It is a project well under way, so much so that the matter of bonds has been provided for in Cleveland and arrangements have been made with the Globe Iron Works Co. whereby the ships will be built for service next year if the financial programme now outlined is carried out. The issue of bonds is dependent, of course, upon well-defined conditions, the main feature of which is a stock subscription up to quite a large amount. The work of securing the necessary stock subscriptions is now under way.

The two side-wheel steamers, options for which have been given to Mr. E. A. Davis, Detroit promoter of the line, are planned to be among the finest vessels of their kind ever built. They will cost together not less than \$1,100,000. It is proposed to give each of them 6,000 horse power in propelling engines, in order to meet the requirements of the long run between Buffalo and Detroit. Mr. Davis has gone into all the details of securing options on terminals, providing for a passenger and freight organization and otherwise arranging the preliminaries of a big undertaking of this kind. The establishment of the line would involve at the outset an expenditure of about \$1,250,000. He says he is confident of securing stock subscriptions sufficient to meet the requirements of the bond arrangement. Mr. Davis was one of the founders of the fish trust and has some very good connections. He has entered into this matter in a thorough business manner, and has certainly stirred up the managers of the two other Lake Erie lines. Their main argument against the scheme is that vessels of higher speed than the new Cleveland-Buffalo line steamers can not be built within the limits of commercial requirements and that even if the speed required for the long Buffalo-Detroit run could be attained, it would be at such an enormous sacrifice in operating expenses as to make the undertaking a failure.

"But these are the arguments of opposition companies," says one of the advocates of the new line. "They say they are opposed to the building of these new vessels for the reason that the Buffalo-Detroit line would be a failure and the vessels would have to be bought up by them in order to avoid competition eventually on their own routes. But that is not their position. They have fought at the outset any and all propositions for new lines in the territory from Mackinaw down to Cleveland and Buffalo. They are not to be blamed for protecting their own interests to the utmost, but any argument of the kind that says 'this is our territory and no one else shall come into it' is not sound business argument. It is well known that following up the great success of the Detroit & Cleveland company, the Cleveland & Buffalo line has made a remarkable showing, especially during the past year, and knowledge of these facts will help the new enterprise. I would not be at all surprised to learn shortly that the necessary stock subscription for the new line has been secured, in view of the arrangements that have been made for floating bonds."

SALES OF VESSEL PROPERTY.

Sales of lake vessel property other than the Wolvin steamers, referred to elsewhere in this issue, include a controlling interest in the steel steamer Centurion, which has just passed to Mr. W. G. Mather of the Cleveland-Cliffs Iron Co. The Centurion, built by F. W. Wheeler & Co. in 1893, is not now among the largest freighters, but she is a well built ship that cost \$265,000 when built and may readily be lengthened so as to greatly increase her capacity. Arrangements are also being made whereby the steamer Globe, which is being lengthened at the works of the Globe company, will very probably be sold to Cleveland parties within the next few days.

Mr. W. A. Rogers of Rogers, Brown & Co., who control the Tonawanda Iron & Steel Co., Iroquois furnaces and other iron manufacturing properties, is still engaged in getting together a fleet of light-draught, wooden vessels that will be suited to the Tonawanda ore trade. He will purchase probably eight or ten from a list of about forty which he has under consideration. Thus far he has purchased, subject to inspection, the steamers Gratwick, Quito, Veronica, Spencer and Swain, and the barge Amboy, as well as the whaleback barge 101, the first of the McDougall type of barges, and the Spencer's consort the Pennington. It is understood that Vanderbilt interests, represented by a firm of Buffalo brokers, are trying to secure a few package freight boats of Welland canal size that would be suited to Ogdensburg trade. Small package freight boats are also wanted in several other lines, and the vessel men who have kept wooden steamers of medium size in good condition now find that kind of vessel property worth double what it would sell for a year ago.

The scarcity of naval shipwrights during the past few years has become a matter of such serious importance that the British Admiralty has adopted a system of recruiting that is sure to be severely criticised by the mechanical branches of the service and the outside trade-unions. In April 150 lads, fresh from school, are to be entered at the several dock yards as shipwright apprentices, but instead of being given freedom of action on the termination of their apprenticeship, they will be compelled to sign articles to serve as shipwrights in the navy for twelve years from the age of eighteen. London Truth points out that, as the lads on joining the dock-yards will only be fourteen years of age, they will actually be signing articles to serve the Admiralty for a period of sixteen years.

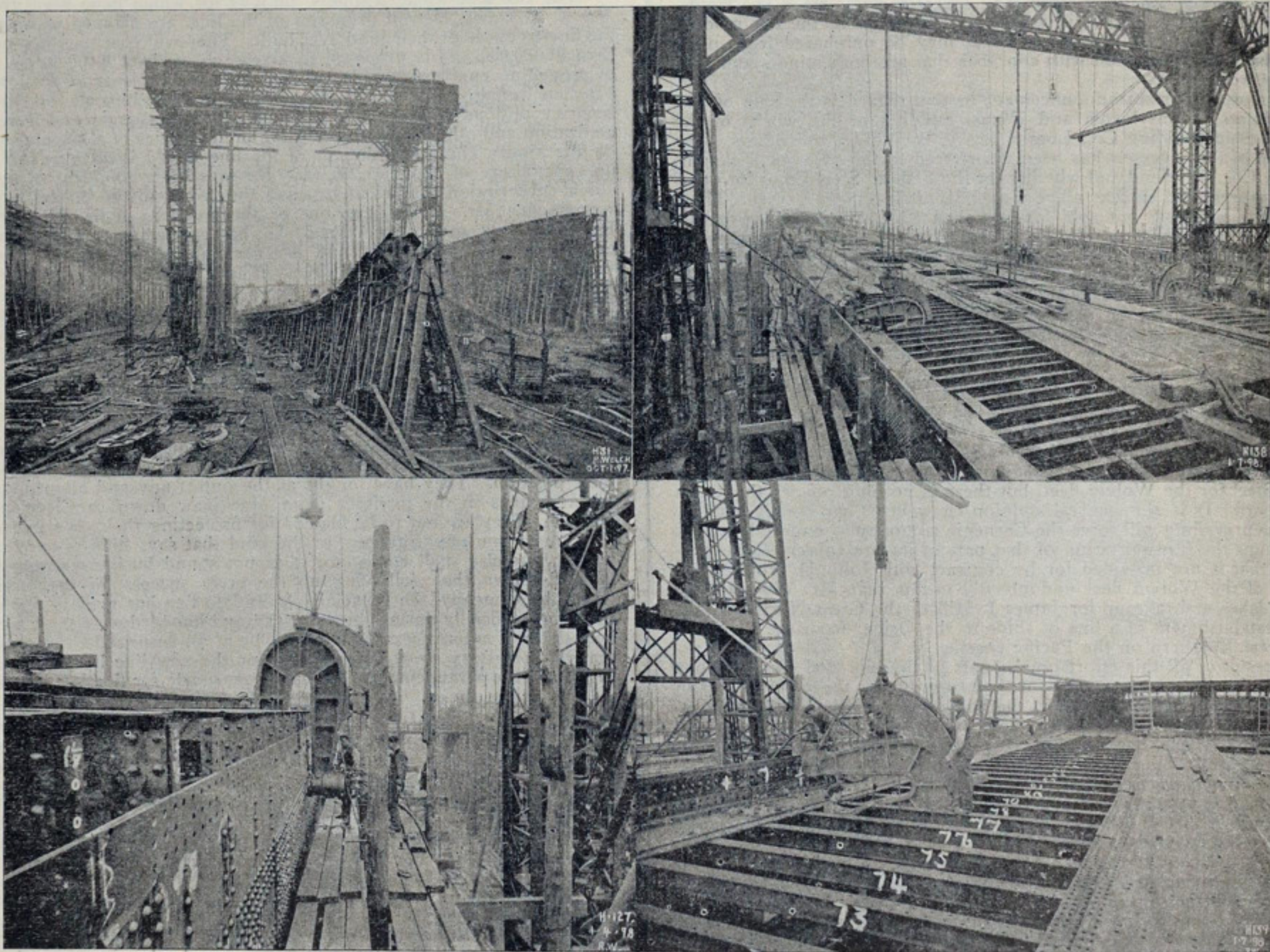
LARGE SHIP YARD TOOL.

THE IMMENSE GANTRY USED IN THE CONSTRUCTION OF THE OCEANIC AT THE WORKS OF HARLAND & WOLFF, BELFAST, IRELAND—SHIP BUILDERS OF THE UNITED STATES WONDER AT THE USE OF SUCH AN EXPENSIVE APPLIANCE, AS AGAINST THE HANDY PNEUMATIC TOOLS OF THIS COUNTRY.

When the White Star liner *Oceanic*, the largest vessel in the world, was launched at the works of Harland & Wolff, a short time ago, a feature of the great Belfast ship yard, more conspicuous probably than the *Oceanic* herself, was the great gantry and hydraulic riveters used in the construction of the vessel. This gantry and the riveting machines which it handles were referred to briefly in a description of the *Oceanic* printed recently in these columns. We are now enabled to present a few views of the vessel under construction, showing more clearly the operation of this mammoth device. Before proceeding to a description of the gantry, however, it may not be out of place to say that ship builders of the United States wonder that Harland & Wolff should go to such evident

ling the several motions. In addition to these four jib cranes, there are three hydraulic traveling cranes worked at the top of the gantry which traverse the full width. These cranes were mainly used for carrying portable riveting machines which were suspended directly from hydraulic lifts hung from the carriages of the traveling cranes by flat steel links so arranged as to be easily put in or taken out according to the height at which the machines were being worked. Thus, after the riveting up of the double bottom, and as the construction of the ship advanced, links were taken out and the machines brought to bear upon the deck and other parts higher up. The motion of the traveling cranes is controlled from the level at which the riveting machines are worked by hand chains depending from sprocket wheels on the cranes.

The propulsion of the gantry as a whole is effected by hydraulic engines attached to the vertical legs of the gantry, actuating the wheels of same through suitable gearing. In order to ensure that both sides of the gantry shall always advance equally, the two sides are geared together by vertical and horizontal shafts carried up two of the legs and across one of the main top girders. The rails on which the gantry travels consist, on each side of the berth, of a pair of strong steel H section bars, having riveted upon the upper surface flat steel bars, the whole bedded upon continuous blocks of concrete built upon close underground piling. The total length of the rails is about 650 feet, and the span of the gantry measures 100 feet from center to center of each pair of double rails. The clear height from rail level to the under side of the cross girders of the gantry is 98 feet, and the clear space between the vertical



MAMMOTH GANTRY AT THE WORKS OF HARLAND & WOLFF, BELFAST, IRELAND.

great expense in the building of the *Oceanic*, whereas in this country, and especially at the works of the Chicago Ship Building Co., we are doing exactly the same work with pneumatic tools that can be moved by hand, and in addition are driving all shell rivets by power, while the Belfast works, unable to reach all parts of a ship with a device of this kind, are doing practically only the sheer strake and upper deck stringer.

The Belfast gantry is an immense structure. The wonder is how can Harland & Wolff hope to take full value out of so mammoth a tool? It is built throughout of steel, and consists of four vertical standards or legs, each pair of legs having a horizontal rider or cross girder. Lattice bracing is adopted throughout, and at the corners where the vertical and horizontal portions meet there are rigidly braced plate girders which render the whole structure strong and rigid. At each of the four corners a jib crane is fitted, by means of which portable riveting and punching machines were suspended, and the material entering into the structure was handled. Each crane is capable of lifting a load of about four tons through a height of 80 feet, at a rake of 40 feet. All the motions—lifting, racking, slewing—are performed by hydraulic power. The cranes swing through an angle of 180 degrees, and can thus cover a space of about 80 feet on each side of the center line of ship. The hydraulic cylinders and valves for operating them are fixed to the four legs of the gantry near the ground line, and steel wire ropes pass over guide pulleys for control-

legs is 95 feet. Hydraulic pressure and return piping is carried up each of the four legs and across the top of the gantry, suitable branch pieces and hydrants being provided where necessary for coupling to riveting machines, etc., in whatever positions they may be required. The pressure is taken from an hydraulic main laid alongside the berth, the connection being made by large flexible-armored hose. The exhaust water is also returned to the pump station through suitable means, so that the same water is used over and over again. On each side of the gantry, at different levels, are rivet heating furnaces which enabled the riveting machine to be easily supplied with rivets at any part of the ship. Amongst the riveting machines used in the construction of the *Oceanic* were some having a gap of 7 feet, and capable of dealing with rivets $1\frac{1}{4}$ inch diameter. Another notable appliance was a portable hydraulic punch, capable of punching $1\frac{1}{4}$ holes in plates $1\frac{1}{8}$ inch thick. These were used for punching the plates in the top strakes of the ship, the plates being fixed against others which had been previously punched, the portable machine using this as a template. Electric drilling or reaming afterwards insured the exact fairing of holes.

A modification of plans for the floating dock at Algiers, La., is proposed, and the formal contract between the government and the Maryland Steel Co. is delayed on that account.

OUR NEWEST NAVAL VESSELS.

DECISION OF THE NAVAL BOARD OF CONSTRUCTION AS TO ARMAMENT FOR THE THREE SPANISH GUNBOATS RAISED AT MANILLA.

It is announced that the naval board of construction has, upon the recommendation of Admiral Dewey, decided to retain permanently the names Don Juan de Austria, Isla de Cuba and Isla de Luzon, originally held by the three Spanish gunboats captured at Manilla. These vessels, which were sunk at the battle of Manilla, were subsequently raised by Naval Constructor Capps and have since been rebuilt. In the matter of armament the naval board has recommended that the Don Juan de Austria have four 5-inch guns, four 6-pounders and four Colt automatic guns, and that the Cuba and Luzon each have four 4-inch guns, four 6-pounders and four Colt automatic guns. The guns will be shipped to San Francisco in April.

The work of raising these vessels has presented some very interesting engineering problems. Work on the Cuba, the first of the vessels upon which operations were undertaken, was begun Oct. 29 by the Hong Kong Dock Co. which had agreed for \$800,000 silver to raise the three vessels. Three centrifugal pumps of 6, 9 and 12 inches respectively were employed, one to drain the forward part of the deck, one the engine room and one the afterpart. The conditions were such that it was possible to operate the pumps only at low tide. The fact that the vessel had settled into a bed of mud added to the difficulty of the problem, and several failures preceded the successful attempt to raise her. In the first instance all three pumps were set to work, but although a buoyancy of 1,400 tons was given the vessel she did not move. The plan which eventually proved successful was to work only the after pumps, while the forward one stood idle. With the after compartments thus cleared, the vessel was given a buoyancy at the stern, which caused her to rise gradually. Then additional problems presented themselves in quick succession, due among other things to the fact that several compartments were not reached by the ship's drains. The smaller bunkers and the boilers were full of water.

After being floated, the vessel on two occasions went clear to the bottom again, and several times in addition she was raised part way and then settled back. Each time the difficulty came from the fact that the vessel would sink into a mud berth, from which she could only be rescued by the most tedious process. After she had been dragged as far as possible, the gunboat was allowed to settle and make a new berth for herself, from which she was in turn raised and dragged a little distance further before she would again fill. Eventually the vessel was brought to deep water.

The line of operations followed in the case of the Luzon was very similar to that of the Cuba, save that the problem as complicated by the fact that in sinking she had backed into a submerged wreck. Her propellers had become fouled and one blade was broken and four badly bent before she could be gotten clear. The work on the Austria was facilitated considerably by reason of the fact that the drainage system on that vessel is vastly superior to that of the other gunboats. The condition of the vessels was really much better than could have been anticipated. The fires set by the American shells of course burned them all out aft, and in the case of the Austria the fire had gone well forward. Fortunately the engines were found in admirable condition, everything considered. They had been heavily coated with oil when the ships went down, and upon this a deposit of mud formed, the two constituting a very satisfactory protection. The Cuba and Luzon are English-built, steel, twin-screw vessels of 1,300 tons. The Austria was built in Spain.

FINE NEW RIVER STEAMER.

The new Pittsburg and Louisville side-wheel steamer City of Pittsburg is now nearing completion at Marietta, O. The vessel, which is the largest and finest craft built on the upper Ohio river in some years, is 300 feet in length, 79½ feet beam and 6¼ feet depth of hull. The cylinder diameter of engine is 26½ inches and the stroke 10 feet. Steam will be supplied from three Scotch boilers. The appointments of the vessel are most elegant, including electric bells, bath rooms, barber shop, etc. The capacity will be about 175 passengers and 1,500 tons of freight. The City of Pittsburg is owned by Capt. John M. Phillips of Pittsburg and Capt. Dana Scott of Zanesville, O. Her first trip will be from Pittsburg to New Orleans.

Important improvements projected by the Great Northern Ry. Co. are reported from the head of Lake Superior. The lease of the coal dock now occupied by the Ohio Coal Co. on the Wisconsin side of the bay at West Superior expires on May 1, and the dock will from that date be occupied by the Great Northern for its fuel business. The Ohio Coal Co. will continue business from its dock on the Duluth side of the bay and will possibly arrange with the Great Northern company with reference to the hoists and machinery left on the dock. It is also announced that the contract for building the foundation of a new 3,000,000-bushel steel grain elevator at Superior has been let. Its location will be on the site of No. 1 coal dock, now occupied by the Northwestern Fuel Co. The elevator will be modeled after the ones in Buffalo, but 500,000 bushels larger. The excavation for the foundation will require the removal of 70,000 cubic yards of material and the driving of 30,000 piles.

Leading men of the engineering profession in the United States, and especially those of the navy, appreciate very much the writings of Rudyard Kipling along engineering lines. If it were not for Mr. Kipling's illness, arrangements would very probably have been made for a dinner in his honor at the Engineers' Club, New York. The dinner was suggested a short time ago by Engineer-in-Chief Geo. W. Melville of the United States navy, and was immediately taken up by the club.

Fuel trials are still in progress on the British torpedo boat Surly. Patent fuel is the latest tried. It gave less heat than the oil fuel but also less smoke. The black smoke produced is, at present, the most serious objection to the oil fuel.

STEAM PUMP CONSOLIDATION.

It is the general impression that very little change will be made in the conduct of the steam pump business by the formation of the combination that is to be known officially as the International Steam Pump Co., and whose capital of \$27,500,000 will be divided into 125,000 shares of 6 per cent cumulative preferred stock and 150,000 shares of common stock. It is now stated that the companies participating in the consolidation are Henry R. Worthington, Blake & Knowles Steam Pump Works, Limited, Deane Steam Pump Works, Snow Steam Pump Works and Laidlaw-Dunn-Gordon Co., the concerns mentioned transacting, it is claimed, fully 90 per cent of the pump business of the United States. All plants will continue to operate individually. Branch offices will be continued, and about the only immediate perceptible effect is likely to be found in the elimination, to a certain extent, of competition, owing to the establishment of uniform price lists.

The directors will be Charles C. Worthington of the Henry R. Worthington corporation, Max Nathan of the George F. Blake Mfg. Co., Charles L. Broadbent, vice president of the Blake company, Lewis E. Fellows of the Deane company, John G. Mackintosh of the Deane company, Robert Laidlaw and John W. Gunn of the Laidlaw-Dunn-Gordon Co., Danied O'Day of the Snow Steam Pump Works, James H. Snow, Philip Lehman of Boston, and Edward F. C. Young of New York City. The assets of Henry R. Worthington are estimated at \$6,148,355, and the net profits for 1898-99, based on ten months business, at \$550,000; Blake & Knowles works assets \$3,178,000, with net profits at the rate of \$425,000; Deane Steam Pump Works \$1,155,000 assets, with net earnings at \$111,973; Laidlaw-Dunn-Gordon Co. \$800,000, with profits at \$70,000; and the Snow Steam Pump Works \$700,000, with profits at \$55,000. It will be seen that the aggregate profit for the five concerns based on ten months of 1898, and as above stated, is over \$1,200,000, which it is claimed will prove sufficient to pay the preferred dividend and allow 3 per cent on the common stock. The control of the companies is taken over free from debt with assets valued at \$12,000,000. Of this \$4,700,000 is in cash merchandise and accounts and will furnish ample working capital for the new organization.

Reservation from the authorized capital of a requisite amount of preferred stock will be made to provide for the retirement of \$2,000,000 7 per cent cumulative preference shares of Henry R. Worthington and \$1,150,000 6 per cent debentures and \$500,000 8 per cent preference shares of the Blake & Knowles company. An amount of common stock to facilitate the retirement of these outstanding securities will also be deposited. It is proposed to retire these securities by the sale or exchange of the preferred and common stock of the new company.

In regard to the estimated savings through consolidation, the prospectus says: "Each of the five companies now maintain agencies in the principal cities of the United States. The Worthington and Blake companies have stores and carry stocks in London, Paris, Hamburg, Vienna and other cities. Some of them have expensive salaried managers. All these agencies in this and other countries will be consolidated; the stores and agencies maintained in the cities of this country and the forces of clerks, salesmen, etc., necessary to conduct them will be united and decreased, involving an estimated saving of at least \$500,000 per year. The expenses of each company for their drafting department, incident to the elaborate drawings and specifications for estimating on work, when united will bring about a further reduction. The standardizing of the patterns for foreign and domestic work, which is now under way in the Worthington factory, when applied to the entire business of the new company will result in an estimated saving of at least \$200,000 per year. A conservative estimate of the advantages derived from consolidation is believed to be \$1,300,000 over the present earnings, which would make a total of future net earnings, with the estimated earnings based on ten months of the year's business, of \$2,500,000, or 6 per cent on the preferred stock and over 11 per cent on the common stock of the new company."

NEW PLANT OF THE MCLELLAN DOCK CO.

New Orleans, La., March 21.—Ship owners having vessels plying to southern ports will be glad to learn that rapid progress is being made in the work of reconstructing the sectional dock originally built for the United States government at Pensacola, Florida, and recently purchased by the McLellan Dock Co. of New Orleans, La. This steel dock, consisting of four sections when completed, will have a length of about 300 feet on keel blocks, a draft of 27 feet and a lifting capacity of 350 tons dead weight—equivalent of a 4,000-ton ship. The pumps, engines and machinery are all of modern construction, capable of lifting and operating a dock 400 feet long.

The McLellan Dock Co., although already owning and operating two dry docks in Algiers, La., (the Ocean and Marine, the former with a lifting capacity of 1,000 tons, the latter of 1,300 tons) in order to meet the demand for increased docking facilities for vessels of large tonnage and deeper draught, found it necessary to secure this larger dock and to move its plant from Algiers to a point some two miles further down the Mississippi river, where a straighter current, safer water, and more extensive and convenient barge privileges could be secured. There—at McLellanville—the company has a clear frontage of nearly three-quarters of a mile, on which it has located its entire plant and has erected wharves, sheds, shops, offices and all the essentials of a modern ship and dock yard. With ample water front for all possible requirements of its business, with derrick boat, large floating fire and wrecking pump, end dock designed for the use of such large vessels as may not wish to go into dock, and with the completion of its steel dock, the McLellan company can supply all the facilities demanded by the increased importance of New Orleans as a port and the greater draught and carrying capacity of modern ships. Should future conditions warrant it, a fifth section may easily and quickly be added to their steel dock, thus making it possible to raise battleships and vessels of the largest size and weight.

Rear Admiral Hichborn, chief constructor of the United States navy, has recommended that the \$100,000 worth of repairs which will be necessary on the cruiser Raleigh, now enroute home from Manilla, be made at the Portsmouth navy yard.

CONDITION AND PROSPECTS OF THE IRON TRADE.

General Manager Swank of the American Iron & Steel Association makes the following answer to an inquiry from the Iron and Coal Trades Review regarding the condition and prospects of the iron trade in the United States:

"You ask whether the existing prices of iron and steel in the United States will be increased. It is dangerous to hazard a reply to this question, but I will venture the opinion that we have already in most lines, and probably in all lines, come very near to the highest prices that may be looked for this year. While many reasons might be given for this opinion, including the inevitable reaction that is sure to come from the extraordinary stock speculation of the last few weeks, which has had a stimulating effect on the general industrial situation, the principal reason that influences my opinion is the fact that in all iron and steel lines, without exception, we have a greater producing capacity than will be required to meet any possible demand that may exist this year. To illustrate: In publishing a few weeks ago the details of our production of 11,773,934 tons of pig iron in 1898 I said that 'taking a survey of the whole field and eliminating all furnaces that are never likely to run again, we estimate the actual idle furnace capacity of the country today at 4,500,000 tons per annum, of which probably 2,500,000 tons will be available in the next six months if there should be an extraordinary demand for pig iron.' These words were written in January, and our weekly production of pig iron has not since increased. The consolidations of manufacturing companies that have taken place in this country during the last few months have had for a leading object the checking of ruinous competition, which only an excess of capacity could have produced.

"In answer to your second interrogatory, as to the extent of the producing capacity, I think that, with a producing capacity in excess of our wants, which we will fully supply, and with prices but little, if any, higher than they are now, we are likely to seek foreign markets for the sale of a constantly growing percentage of our production. More specifically stated, we are likely to produce a considerable surplus of iron and steel for export, because our prices have not yet advanced so far as to operate as a check to our export trade, which our manufacturers have been industriously cultivating.

"Your third interrogatory asks whether our existing resources of production are likely to be largely increased within a reasonable period. A correct answer to this question depends, of course, upon the continuance of the present active home demand for iron and steel. I think that this demand is likely to be maintained throughout this year, increasing perhaps in certain lines, but beyond the present year it would be unwise to indulge in speculation. At present our industrial sky is bright, but our political sky is not, and the one may cloud the other next year, when we are certain to have a most exciting presidential and congressional campaign. Today our horn is exalted. Our iron and steel industries are most active.

"Answering your fourth interrogatory, if there should be a demand for iron and steel beyond that which now exists, our already developed resources in raw materials and in manufacturing plants are abundantly able to meet it. There are absolutely no obstacles to an immediate increase in our production of iron and steel. We have iron ore and coal in abundance, with mines already opened and coking ovens already built that will meet any possible demand, and we have blast furnaces, rolling mills, steel works, wire mills, tin plate works, foundries and machine shops galore—all of the latest and best types. The boom in our iron trade in 1879 and 1880 found us wholly unprepared to meet it; the boom of 1898 and 1899 finds us fully prepared at every point."

STRONG NORTHWESTERN GRAIN OUTLOOK.

Duluth, Minn., March 21.—With 18,970,143 bushels of grain of all kinds in store here at the opening of the present week, against 11,217,201 bushels on the corresponding date a year ago, it is not surprising that grain shippers are unable to charter any more vessels to arrive in the spring at 2½ cents. One of the most conservative of the vessel agencies here says in a letter just forwarded to lower lake owners:

"The grain statement shows an excess over stocks in store last year of nearly 8,000,000 bushels of grain of all kinds. The increase is, of course, mainly in stocks of wheat, which amount to 9,702,744 bushels, against only 3,019,842 bushels on the same date a year ago. Before the close of the week every bushel of room in the local elevators will be filled. At the opening of navigation in 1898 there were about 13,000,000 bushels in store, but it will probably be well to remember that receipts from the opening last spring until Sept. 1 were of insignificant proportions, while indications now are that the movement of grain to this port after the opening of navigation will be extremely heavy, and the supplies of coarse grains in Minneapolis, which must seek a market via Duluth or Lake Michigan, are very large. The 2½-cent rate was established with practically no assistance from the wheat shippers, who are unable, as yet, to do much with the New York buyer. Indeed, the quantity of wheat under charter is less than 1,500,000 bushels. The supply of hard coal is practically exhausted, but there will be considerable soft coal on the docks at the opening. It is reported the ice extends as far as Grand Marais, Minn., a distance of about eighty miles."

The long anticipated official confirmation of reports regarding experiments with the French submarine boat *Gustave Zede* has arrived in the form of a declaration by M. Lockroy, minister of marine in the chamber of deputies. He says that experiments with the *Zede* have been conclusive in proving her capable of real service—that she not only succeeded in torpedoing an iron clad at a distance of 400 metres, but displayed satisfactory seagoing qualities and made the trip from Toulon to Marseilles in very rough weather. The minister referred at some length to the one original fault to be found with the vessel, namely, that she was blind and unmanagable at a certain distance below the surface, but he stated that this had been remedied by fitting the vessel with a conning apparatus, which allows her to be steered without coming to the surface and yet to perceive enemies with sufficient distinctness to secure accurate aim.

MONTREAL, OTTAWA AND GEORGIAN BAY CANAL.

Ottawa, March 22.—The present session of the dominion parliament will without doubt witness an attempt to push through a project for subsidizing the Montreal, Ottawa & Georgian Bay Co., which proposes to build a canal uniting the waters of Lake Huron with those of the St. Lawrence by way of the Ottawa river, Lake Nipissing and French river. This is an idea which has made its appearance in Canadian politics at intervals during the past forty years. Three different surveys of the route have been made, resulting in three widely different estimates of the cost, but experts have now settled down to a conclusion that to secure a 14-foot channel all the way would involve an expenditure of from \$17,000,000 to \$20,000,000. It is on the basis of this estimate that the promoters of the plan are now asking for public assistance. They ask the government to guarantee 2 per cent interest per annum on \$17,000,000. Mr. McLeod Stewart, president of the company, states that if such a guarantee is given the firm of S. Pearson & Son, of London, Eng., one of the largest contracting firms in the world, has agreed to raise the money and do the work within four years, the government guarantee not to become operative until the canal is opened for traffic. Mr. J. I. Tarte, the Canadian minister of public works, is known to be in favor of granting the subsidy asked for, and conversation with members of parliament shows that many of them look at the matter in the same way. If satisfactory assurance is given that the canal can be constructed on the terms stated and that the government will not be called upon for further help when the contract is half completed, there is little question but that the matter will secure favorable consideration from parliament. Mr. McLeod Stewart left for London, England, last Saturday to consult the firm of S. Pearson & Son. He will be back in about a month. The canal, if constructed, will save a distance between western lake ports and ocean navigation of almost 450 miles, as compared with the Erie canal, and 375 miles as compared with the present St. Lawrence route. It is also pointed out that such a canal would, in case of necessity, enable English vessels of war to reach the upper lakes by a route which is remote from the American frontier.

The North Shore Navigation Co. and the Great Northern Transit Co. of Collingwood, Ont., have been consolidated and will henceforth be known as the Northern Navigation Co. of Ontario, Limited. The capital of the consolidated company is to be \$1,000,000. A freight and passenger service is to be provided for all the ports on Georgian Bay and from Collingwood to Sault Ste Marie, Port Arthur, Fort William and Duluth. Officers of the company are: President, James Scott, Toronto; vice-president, J. J. Long, Collingwood; directors, Thomas Long, Charles Cameron, C. E. Stephens, Collingwood; H. E. Smith, Owen Sound; William Sheppard, Waukegan; M. Burton and F. A. Lett, Barrie.

The Marine Insurance Association of Montreal has decided to make a general advance in maritime insurance rates on vessels doing business in the St. Lawrence river. This action on their part is said to be necessitated by the present condition of the channel, and the hope is held out that the advance may not be kept in operation for more than one season.

NEW TYPE OF LIFE BOAT.

A peculiar lifeboat, devised by Albert Henry, was tried in February at La Rochelle, France. In its outer appearance it differs little from an ordinary lifeboat. We may imagine it to be built up of two shells separated by an unusually large continuous air chamber, which extends all round and from bow to stern. The inner floor is intended always to be kept above the water level. Such a boat needs a heavy keel to steady its motion, and a drop keel has been adopted. This centre board moves up and down a longitudinal slot, which divides the keel and the air chamber. It consists of sheet iron and is loaded with a spindle-shaped body of lead. The slot is purposely left open above so that any water may run off quickly. The drop keel serves a double purpose. It steadies the boat, and it pulls it back, when a powerful wave seems likely to overturn it. When the boat is landing the keel is raised into the slot by means of ropes attached to the masts. The experiments were made by officers of the French navy and others with a boat 32 feet in length, built by Decout-Lacour. According to La Nature, the boat behaved exceedingly well. When overturned with great trouble, it at once righted itself again, and the water ran out in four seconds. When suddenly deluged by the water of a large tank placed ten feet above the craft, the boat was submerged for a moment. But it was more a recoil than a sinking, and within a few seconds the boat floor was free from water again. To allow the water to flow off so rapidly, the slot must have a certain width, and such a slot, although it does not cut the whole length of the keel, must impair the strength of the boat. It looks, moreover, as if the available space were too limited. It will be interesting, however, to hear how Henry's lifeboat will answer in the open sea.—English Exchange.

The announcement that Capt. Alexander McDougall had severed his connection with the management of the American Steel Barge Co. is undoubtedly premature. The rumor probably originated from the fact that Capt. McDougall has organized a company in Duluth for the purpose of conducting a general vessel business under the firm name of Alex McDougall & Co. Mr. Wm. A. Thompson, Jr., will be associated with Capt. McDougall in the new firm. Success will undoubtedly attend this undertaking on the part of Capt. McDougall, as he enjoyed a very large business when engaged as a vessel agent at the head of the lakes before the American Steel Barge Co. was organized and still retains some valuable connections. It is understood that one special aim of the new firm will be to stand aloof from any interests that might interfere with impartial treatment for such vessels as they may represent.

Annual reports regarding affairs of the Richelieu & Ontario Navigation Co. of Montreal show that the gross receipts in 1898 were \$728,943.97, as against \$668,026.09 in 1897; operating expenses \$590,936.53, as against \$552,980.94 in 1897; fixed charges \$25,979.89, compared with \$26,945.09 in 1897, and a net profit of \$112,027.55 as against \$108,130.06 during the year previous. After the payment of the semi-annual dividend of 3 per cent., amounting to \$104,600, the balance carried to surplus amounted to \$7,627.55. The increase in operating expenses is mainly due to improvements made on several of the company's steamers.

TO MANAGE SHIPS ON THE PACIFIC.

IT IS THE GENERAL BELIEF THAT MR. A. B. WOLVIN IS TO UNDERTAKE THE ESTABLISHMENT OF A LINE TO THE ORIENT FOR THE GREAT NORTHERN RAILWAY.

Following closely upon his return from a visit to the Pacific coast with President James J. Hill of the Great Northern Railway, Mr. A. B. Wolvin of Duluth is engaged in negotiations that will very probably close out entirely his extensive interests in lake vessels. It is generally understood among vessel men close to Mr. Wolvin that he is about to take up at a very large salary—not \$40,000 a year but probably more than half that amount—the establishment of a steamship line for the Great Northern company on the Pacific, to extend not only to China and Japan, but also to eventually take in the traffic of Siberia. The present traffic arrangement of the Great Northern company with the subsidized Japanese steamship line is certainly far from being satisfactory to Mr. Hill. That he is determined to have a line of his own on the Pacific was shown most clearly when he appeared before committees of congress, a few weeks ago, to urge passage of the Hanna-Payne shipping bill. Now that that measure has failed, Mr. Hill has evidently decided to go on and buy or build ships, irrespective of what the United States government may do, so as to carry out his plans for trade with the Orient. At the hearings in Washington he said:

"A few years ago, when we were building our railroad to Puget sound, the question of traffic was an urgent one with us, and I sent two men abroad, one to China and one to India. I kept them there for over a year, and in that way we undertook to arrive at the exact conditions of the traffic, and whether it was a traffic which could be diverted to our country. No one has been more astonished than myself at the result of the efforts which have been made in that direction. I found that our trade with the Orient (mainly with China and Japan) is susceptible of extension almost indefinitely. Last year we carried over 10,000 tons of manufactured cotton in our Puget sound boats, (Japanese line) to Asia from North and South Carolina. We carried about 35,000,000 pounds of raw cotton from Texas. One day during the month of October, or about the 1st of November last, we were offered from Texas alone 20,000 tons of cotton, which we had to refuse. We could carry it by land, but we had no ships to carry it by water, and there were no ships on the Pacific ocean which we could bring there to carry it at a price at which it had to be carried. Now, the trade is not confined to cotton or tobacco or oil. I think it is safe to say that we have refused from 60,000 to 70,000 tons of steel or iron freight in different forms because we had no way to carry that freight on the ocean. What ships were there in the spring, outside of the Japanese line, were largely taken by the government as transports. Even some of the old English-owned ships, that were rather out of date on the Atlantic, and that had been relegated to the trade of the Pacific coast, were taken by the government. Then the English ship-owners to whom they had belonged turned around and built, at the expense of this country, better ships than they had before—new, modern, first-class ships—with which they come in and carry our traffic and take away our money for carrying it.

"There is an interest that affects my people much more than cotton, and that is grain. When I sent men to China and Japan, the question uppermost in my mind was what trade we could do with them, and whether we were going to have trade enough to have ships carrying cargoes back and forth. If there was only to be an outgoing cargo and nothing coming back, the outgoing cargo would have to pay the entire cost of transportation. After I had devoted a good deal of time to the matter, and got the information from the men I sent abroad, I took the question up with an intelligent Chinese merchant on the Pacific coast. I wanted to know when we had introduced our wheat or grain into China, and it had displaced their rice, what they would do with the rice, and whether the price of their rice would not fall so low that the people would have to go back again to the use of rice, and so displace our wheat. This Chinaman told me that in the district from which he came there were some 18,000,000 of people, and he said that if we gave them 1 ounce of wheat a day per capita it would take all the wheat we could export and more, and that we could not displace a great deal of rice with an ounce of flour per day per capita. He said that the question would not arise for fifty years. He said: 'In China and Japan we have fully one-third of the population of the world. They are a commercial people, an intelligent people. They are not a savage people, roaming about without homes or aims in live. They are a people that you can build up a commerce with.'"

Mr. Hill said finally in his remarks regarding the shipping bill that he was quite sure in view of doubt as to the passage of the measure that his company would be forced to put ships on the Pacific and to put them under another flag. This is probably what he is about to do now.

The monster dredge Pan-American, now building by Hingston & Woods of Buffalo, will be towed to Portage lake, Michigan, as soon as weather will permit, it being desired to begin work May 1 on a big dredging contract at that place. The dredge will dig 700 yards of earth per hour. Her cost was about \$75,000. The machinery alone weighs more than 400 tons and there is over 250,000 feet of lumber in the hull.

Stewards of the Goodrich Transportation Co., Chicago, are: Steamer Virginia, Edward F. Hobert; Iowa, B. Lohse; Atlanta, Chas. McKaig; Indiana, Wm. Reardon; City of Racine, Gavin Watson; Georgia, C. B. Hamilton; Chicago, Charles Pinsoneault; Sheboygan, Burton Forbes; chief steward, H. J. McCarthy. The appointment of a steward for the Christopher Columbus will be made later.

Ten days stop-over at Washington—Tickets to Philadelphia and New York over Pennsylvania short lines may be obtained via Washington, and good for a ten days' visit at the national capital, at the same fare as apply to Philadelphia and New York over direct lines of Pennsylvania system. For further particulars apply to Pennsylvania lines ticket agents or address C. L. Kimball, passenger agent, Cleveland, O.

COMMERCE OF DULUTH AND SUPERIOR.

In accordance with the law requiring reports from government engineers as to the commerce of all channels, ports and other places where the general government provides improvements, Major Clinton B. Sears, in charge of improvements on Lake Superior, has just issued an exhaustive statement of lake commerce to and from the ports of Superior and Duluth, the one in Minnesota and the other in Wisconsin, and both situated on a bay that is in reality one harbor. Similar reports from engineers in all parts of the lakes would prove highly valuable, but it is unfortunate that the conditions in many places are such as to render most of the engineer reports on this score very unreliable. They are made up in many cases from incomplete data of the kind furnished by collectors of customs, whose jurisdiction over coastwise commerce is so limited as to render their reports quite valueless. At Duluth and Superior the situation is different. Direct reports are secured by representatives of the United States engineer office from all vessels entering or leaving these ports.

Major Sears' statements show that the number of net tons of freight of all kinds entering and leaving the ports of Duluth and Superior during the season of navigation in 1898 was 10,127,261 against 8,475,224 tons in 1897, 7,886,883½ tons in 1896 and 6,325,351 tons in 1895. The value of this freight was as follows: 1898, \$142,643,020; 1897, \$118,551,185; 1896, \$111,676,900; 1895, \$95,000,000. More complete summaries of the statements follow:

CONDENSED STATEMENT OF COMMERCE AT THE HEAD OF THE LAKES, DULUTH AND SUPERIOR, DURING NAVIGATION SEASONS OF 1895, 1896, 1897 AND 1898.

	1898	1897	1896	1895
Number of vessels arriving.....	5,519	4,864	5,527	5,505
Registered tonnage.....	7,014,924	6,342,118	6,626,101	5,665,752
Number of vessels departing.....	5,351	4,894	5,421	5,481
Registered tonnage.....	7,120,313	6,503,747	6,726,967	5,778,520
Arrivals and departures, vessels.....	10,870	9,758	10,948	10,986
tonnage.....	14,135,237	12,845,865	13,353,068	11,444,272
Receipts, net tons.....	2,979,809	2,492,420	2,407,880½	2,035,465
Value of receipts.....	\$31,578,955	\$28,963,122	\$27,717,561	\$27,443,512
Shipments, net tons.....	7,147,452	5,982,804	5,478,953	4,289,886
Value of shipments.....	\$108,064,065	\$89,588,063	\$83,959,339	\$67,556,488
Receipts and shipments, net tons.....	10,127,261	8,475,224	7,886,880½	6,325,351
Value of receipts and shipments.....	\$142,643,020	\$118,551,185	\$111,676,900	\$95,000,000

SUMMARY OF LAKE COMMERCE, DULUTH AND SUPERIOR, SEASON OF 1898.

	DULUTH.		SUPERIOR.	
	Net tons.	Valuation.	Net tons.	Valuation.
Receipts.....	1,061,657	\$18,380,315	1,918,152	\$16,198,640
Shipments.....	4,871,161	\$60,622,877	2,276,291	\$7,441,188
Receipts and shipments.....	5,932,818	\$79,003,192	4,194,443	\$23,639,828
Passengers arriving and departing.....	45,082		4,426	

EXTENSIVE IMPROVEMENTS AT CONNEAUT.

The Conneaut terminals of the Pittsburg, Bessemer & Lake Erie railroad have been the scene of more important operations the past winter. Large as was the amount of ore handled over the Conneaut docks in the season of 1898, the preparations for the present year's business indicate that the record will be far exceeded. Not to name a definite figure, it may reasonably be expected that the 1899 total will be well above 2,000,000 tons. The most important work of the winter has been the excavation on the east side of the Conneaut river for the new docks, over which it is expected the bulk of the direct ore going to Conneaut will be unloaded hereafter. From the government limit on the lake shore to the bend in the Conneaut river just south of the new dock, a V-shaped strip of land has been cut out, requiring the excavation of 125,000 cubic yards. This gives a width of 180 feet at the narrowest point and of 500 feet at the widest point, permitting of speedy turning of the largest vessels that come to the docks. Another piece of excavation was in the railroad yards back of the docks, a cut of 175,000 cubic yards being taken from the hillside, to permit of putting in additional tracks. The channel of the river is now uniformly 20 feet deep opposite the dock space.

The additions to the ore handling equipment give the Conneaut docks exceptional facilities. On the old docks, on the west side of the river, are twelve Brown and six King conveyors, and twelve McMyler rapid unloading machines. These are supplemented by ten revolving derricks of the McMyler type and eight more Brown bridges. The equipment installed on the east side of the river for the new docks will consist of a Hulett machine for direct unloading, and nineteen McMyler and Excelsior "whirlies." Another addition made to the equipment the past winter is four Thew automatic steam shovels with four-ton buckets, a trial of which in the past few days showed 50 tons of ore handled by one machine in six minutes. The Hulett machine for direct unloading on the new dock is under construction and is expected to be finished by May 1. It is manufactured by the Webster, Camp & Lane Machine Co. of Akron, O. Also located on the east side of the slip and south of the turn in the Conneaut river, which has been bridged at this point, is a McMyler coal car unloader, installed the past winter. The shifting of cars on the docks is accomplished by the use of a rope haulage system driven by a 600 horse power engine. Electrical equipment is also provided for the electric lights required for night work.—Iron Trade Review.

The Globe Iron Works Co., Cleveland, has issued invitations for the launch of the steel steamer M. A. Hanna, building for the Cleveland Steamship Co. (Capt. John Mitchell and others) at its yard Saturday afternoon, March 25. The vessel will be christened by Miss Fanny Hanna.

Specifications will soon be issued by the navy department for the new dry dock at the Portsmouth navy yard, which will be almost an exact duplicate of the one at the Boston yard. Considerable pumping machinery, etc., will be required.

MARINE REVIEW

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At the request of a number of its European readers, some of whom have had their interest aroused by the recent rapid growth of American ship building, and others by the prospective American alliance of Vickers, Son & Maxim, the Marine Review has undertaken to make a thorough presentation in picture and text of the resources, facilities and accomplishments of the Newport News Ship Building & Dry Dock Co. in the operation of a plant that is thoroughly representative of the energy and progress of American ship building. This compilation, which will be presented in a special issue of the Review next week, represents the product of many days of work on the part of a representative of the Review sent to Newport News for the purpose, and a photographer who secured pictures of everything worth seeing, and from whose hundreds of negatives more than fifty have been selected for reproduction in this number. Advance orders sufficient to insure a largely increased circulation of this edition have been received from agents and newsdealers.

It is not the intention to give up very much space in these columns to the troubles of the army or navy over the recent Spanish-American war, but we cannot refrain from endorsing the suggestion of the New York Sun that Admiral Schley demand promptly a court of inquiry whereby a determination may be reached as to the merits of the points at dispute in the controversy between the friends of Admiral Schley and the admirers of Admiral Sampson, as to the degree of credit to which each is entitled for the conduct of the naval engagement before Santiago. That so unpleasant a state of affairs should have come to pass in the navy, a service that has been maintained on an almost universally high plane, is particularly unfortunate, and yet that very reputation itself and a desire for its maintenance should prove the best possible argument for insisting that no injustice be done any officer and no unfounded or unjustified opinion be allowed to prevail, either within or without the service. The argument that the public has had enough of and at best rather wearying controversy is not without some foundation, yet for all that there would seem to be no good cause why the same persistence should not be manifested in an effort to secure justice that would be shown in the accomplishment of any less worthy purpose. That with the *esprit de corps* so dominant in the navy an officer should have allowed his friends in the United States senate to block the advance of a considerable number of his fellow officers, who have ever had for him the kindest regard, simply because of personal animosity, is to say the least rather surprising, and may be expected to inevitably result in some alienation of the public feeling which has heretofore been distinctly favorable to Admiral Schley. Admiral Sampson has—even his enemies must admit—done a very grateful thing in writing to Secretary Long requesting the resubmission of the recommendations for the advancement of navy officers, with his own name omitted. Admiral Schley is unfortunately not permitted an action of such entire magnanimity, although there is no reason to believe that he would be less disposed to avail himself of it. A call from him for a court of inquiry should be prompted by the spirit of simple justice.

Governor Roosevelt of New York is commended on all hands for the firm manner in which he has taken up the broad question of the proper policy which the state should pursue in canal matters. With three of the best qualified lawyers in the state retained to investigate charges of corruption in the recent worthless expenditure of practically \$9,000,000 appropriated for deepening the canals to 9 feet, he says that this question affecting the canals is well on its way to solution, as any charge that can be sustained will be pressed home. He is satisfied with, and will be responsible for, the administration of canal affairs as they now exist, but is rightfully opposed to anything further being done until the canal policy of the state—a definite and positive policy—is formulated. With this end in view Governor Roosevelt has certainly selected a commission that will have the full confidence of the people of the state. The commissioners are General Francis V. Greene of New York city, member of the American Society of Civil Engineers; Frank S. Witherbee of Port Henry, member of the American Institute of Mechanical Engineers; ex-Mayor George F. Green of Binghamton; John Scatterd, representing Buffalo business interests; Major T. W. Symons of Buffalo, member of the American Society of Civil Engineers and member of the United States army engineer corps.

The Review is in receipt of a criticism from a well known naval architect that appears on the face of it to be well taken. It relates to the method at present followed in laying up torpedo boats at our navy yards. That the degree of economy forced upon the department should necessitate the boats of this class being laid up at all is, of course, unfortunate, in view of the fact that the whole experience of European nations has been that it results in a loss of speed and diminution of general efficiency. But if it is an absolute necessity the best possible method should be followed. The criticism at hand is to the effect that at the Brooklyn navy yard, for

instance, the boats are arranged side by side in such a manner that should it be desired to put into commission the first vessel laid up, the entire line of boats would have to be hauled out in order to get at the vessel desired. Relief from this inconvenience would seem to be offered by the plan for a revolving table which the department has been considering.

THE MERRIMAC STORY—HOBSON.

Whatever may be the frailties of Naval Constructor Richmond Pearson Hobson, U. S. N., in other directions, there is no doubt that as a writer of a thrilling tale he must be voted an entire success. To be sure he had in his personal narrative of the adventure in the harbor of Santiago, June 3, 1898, and of the subsequent imprisonment of the survivors, the best possible material for a story, but at the same time the reader of the volume "Sinking of the Merrimac," which has just come from press, can not fail to recognize that the young officer has grasped the subject with a keener insight into its dramatic possibilities than would have been displayed by more imaginative writers. The story, which is dedicated to Rear Admiral Sampson, makes a volume of more than 300 pages. Lieut. Hobson takes occasion early in the book to give the credit for the project to sink the Merrimac to Admiral Sampson instead of to himself, which was the impression generally conveyed by articles in the daily press. Interesting also is the preliminary comment on conditions which led to the suggestion of the plan.

"For many weeks," says the author "as assistant naval constructor with the fleet, I had been studying the elements of strength and weakness in our own vessels and the vessels of the enemy, particularly from the standpoint of stability and fire service in battle, and I had made special reports to the admiral upon each vessel. This investigation showed that our vessels were particularly weak before torpedo or mine attack. In fact the New York, the Wilmington and the Helena were about the only vessels of the admiral's squadron that could stand a single torpedo blow, and these vessels were among those least adapted for standing the fire of fortifications. The vessels best adapted for running fortifications, the monitors, would sink like a shot under the blow of a torpedo."

Evidence of Hobson's ingenuity is contained in the description of the manner in which he handled the problem of clearing a channel of torpedos and mines. He submitted for possible use at Havana the outline design of a craft specially constructed to be unsinkable, having the general form of an iron canalboat, operating by its own motive power, rendered unsinkable by being stowed with air tight cans a foot long, and made indestructible by special arrangements in construction and by the use of wire cables. This design was not considered, because the field of operations was to be Santiago and not Havana, and what was desired was a sinkable and not an unsinkable craft. In reply to Admiral Sampson's inquiry as to how an iron ship could be scuttled and made to sink quickly, Hobson, according to his narrative, said: "There seem to be two effective methods, one to drive off the bottom plates from the inside, and the other to explode a series of torpedos placed advantageously on the outside." The method suggested for driving off bottom plates was to select six plates in advantageous positions along the length, about 12 to 15 feet below the water line, cutting off the rivet heads on the inside, leaving the plates simply held in place, then placing a small improvised cannon near the center of each plate, with cross bars to distribute the force of the explosion and cause the plate to be blown off whole in each case, instead of merely causing a hole to be blown through it. The explanation of the final adoption of the torpedo method instead, however, is found in the fact that the cutting off of rivet heads would be difficult under the circumstances and would have involved two or three days delay. The method was to arrange ten torpedos on the port side, placed outside abreast the bulkheads and the cargo hatches, so as to give the maximum sinking effect to a breach opened up by each, the torpedos being carried by a fore-and-aft belt line extending along the outside from end to end, about 12 feet below water, each torpedo in addition having a hogging or girth line extending around underneath the keel, for holding the torpedo in place. The purpose of the fore-and-aft line was to take up the strain due to resistance in the water.

In speaking of his plan for catching the vessel athwart the channel and holding her in that position, Hobson says: "There being only a short distance in which to overcome the speed of the vessel, special elastic arrangements would be necessary to enable the anchor-gear to check and absorb the speed, so as to catch and hold the vessel in the athwart position. To realize this elasticity and at the same time enable the anchor and chain to work automatically, the chain would be roused up out of the lockers and ranged along the deck. After running out a certain length the chain would begin to break the elastic rope stops, one end of the chain being made fast to the chain, the other to a long rope hawser of larger size, so that each stop before breaking would bring into play the elasticity of the large hawser, which itself would be finally broken." Eight-inch new Manilla was selected for the long lengths of elastic hawser, and 5-inch new Manilla for the stops; a large coil of new 4½-inch Manilla served for belt line and eighteen-thread stuff for the hogging lines.

In describing his sensations while the vessel was sinking at the entrance to Santiago harbor, the author says: "The engine stopped and somehow I knew the sea connections were thrown open. This has been a puzzle to me ever since. For how could the bonnet flying off, or the ax blows on copper piping, or the inrush of water make enough noise or vibration to be heard or felt on the bridge, particularly with guns firing and projectiles striking? It may be that the condition of expectation and the fact of the fulfillment of the first part of the order suggested the conclusion, but sure I was that the connections were open and that the ship was beginning to settle."

The whole story is well and simply told and its interest is enhanced by a series of very excellent drawings and reproductions of photographs. Published by the Century Co., New York City. Price \$1.50.

Two important conferences are to be held this year, one in London to discuss, among other things, the laws relating to the liability for losses caused by collision at sea, and another one in this country, a conference of the International Law Association, at which the question of an international code of marine insurance will receive some attention.

LAKE GRAIN TARIFF FOR 1899.

Editor Marine Review: Comments by others upon your article appearing on page 11 of your issue of March 16, 1899, under the above caption, convinces us that its import is not fully understood. The fact is that the grain cargo tariff is based on the Inland Lloyds Register, the 1899 issue of which will be out by the last of this month, in time for its classifications to be used also for lull insurance. Some, after reading your article, write to know, and through your valued journal we desire to inform them that the Inland Lloyds will be out on time and in better form than ever.

J. S. GADSDEN, Commissioner.

Chicago, March 20, 1899.

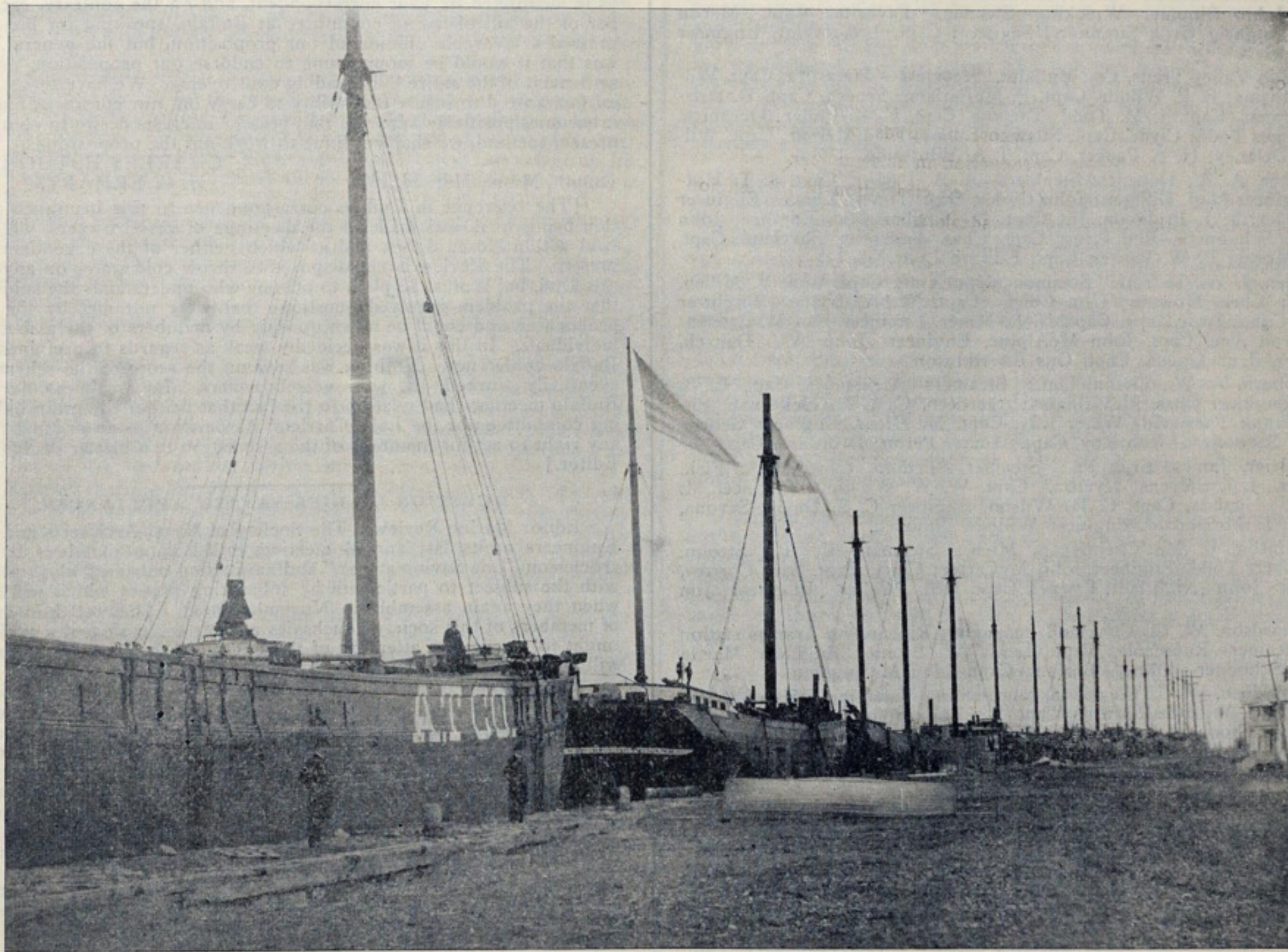
SHIPS HELD UP IN THE ST. LAWRENCE.

A picture on this page takes in nearly all of the fleet of wooden barges from the great lakes that were held up last fall at Valley Field on the St. Lawrence river, while on their way to the Atlantic seaboard under charter to the Atlantic Transportation Co. The list includes the barges S. H. Foster, H. W. Sage, Metacomet, Shawnee, Wm. McGregor, R. Halloran, J. H. Rutter, Charles Wall, Helvetia and F. D. Ewing. The inability of the Atlantic company to move these vessels to the seaboard, largely on account of the lateness of season when the work was undertaken, was in part the cause of the failure of that company. Following the failure, the vessels were thrown back on the hands of their owners, with quite an item of expense in some cases. It is thought that most of these barges will be

SENATOR FRYE ON THE ISTHMUS CANAL.

Senator Frye, the well-known advocate of shipping interests in the United States senate, will not accept the invitation of the Panama Canal Co., extended to a number of members of congress to visit the isthmus next month. In speaking of the matter he is quoted as saying:

"I have been engaged in a consideration of this canal project more or less all the time for nearly twenty-five years, and am satisfied that whatever entertainment the Panama Canal Co. may afford the members of congress on that trip, it cannot give them any information they do not have now or which is not much more accessible here. I was a member of a committee of the house of representatives early in President Hayes's administration that investigated the canal question. At that time there was talk of De Lesseps making a sea level canal, but we very soon satisfied ourselves that that was out of the question. Then we tackled the Chagres river, and came to the conclusion that no force man could exercise would control that stream. God Almighty might harness it, but man could not. Both those schemes have since been abandoned, and now they talk about making a canal to consist of a series of lakes or reservoirs. Our committee unanimously came to the conclusion that the Nicaragua canal was the most feasible route across the isthmus. The committee never made a report because the chairman, Mr. W. S. King of Minnesota, was unable to get the floor to present it. The only tangible result of the committee's work was the establishment of a coaling station on the Pacific side of the isthmus. I became convinced that the United States ought to have one



LAKE FLEET OF BARGES HELD UP IN THE ST. LAWRENCE ON THEIR WAY TO THE COAST.

brought back to the lakes in the spring. There will be more business for them on the lakes during the coming summer than at any time for several years past. A few will probably continue their journey to the seaboard. Mr. N. A. Hawgood of Cleveland has about concluded to send the F. D. Ewing on to New York and will probably send with her another vessel or two, either from his own fleet or through arrangements with some of the other lake owners. If this is done, Capt. Arthur Hawgood will very probably go with the vessels to New York.

The first-class British battleship Implacable, recently launched at the Davenport dock yard, is a sister vessel of the Formidable and Irresistible. She is a vessel of 15,000 tons, with 15,000 indicated horse power and a speed of 18 knots. Her length is 400 feet, beam 75 feet and draught 26 feet 9 inches. Her armament will consist of four 12-inch breech-loading rifles, twelve 6-inch quick-firers, eighteen 12-pounders, twelve 3-pounders and eight Maxims. She will be propelled by twin screws, each screw being driven by a set of triple expansion engines of 7,500 horse power. The armored belt, some 216 feet by 15 feet, is of 9-inch Harveyized steel and in addition she will have armored bulkheads and four submerged torpedo tubes.

The navy department will loan the auxiliary cruiser Dixie, formerly of the Morgan line, to the war department for use as a transport.

there and drew up a resolution declaring that fact, and the committee adopted it. I took it to Secretary Thompson of the navy department and showed it to him as the expression of the views of our committee. It struck him as a good thing to have, and he proceeded at once to secure the station. That was all the committee accomplished."

The committee of Lloyd's Register (British) has decided to undertake in future the survey of refrigerating machinery and insulation on board ship, and have issued instructions to their surveyors as to details of machinery, spare parts and gear to be carried, and as to testing the insulation, which must be sound, in good order and of efficient construction; but nothing is stipulated as to the materials that will be considered as efficient, nor as to the thickness of the insulation. "It would appear to most persons that have any experience with refrigeration on board of ship," says a British journal, "that these two last mentioned items were of considerable importance. As regards the material used, charcoal has not a good reputation, as it has been directly or indirectly the cause of fire; and then as to the thickness of the insulation, should it not be greater in the wake of parts where high temperatures are experienced. There are also other considerations which should not be overlooked, among them the durability of the efficiency of the insulating material, in which respect charcoal has not a good reputation."

APPOINTMENT OF MASTERS AND ENGINEERS.

Goodrich Trans. Co., Chicago: Steamers—Virginia, Capt. H. E. Stines, Engineer G. P. Roth; Columbus, Capt. Robt. Smith, Engineer G. McLaughlin; Indiana, Capt. A. Gallagher, Engineer Ray Flint; City of Racine, Capt. J. Wilson, Engineer W. R. Patterson; Atlanta, Capt. D. Cochrane, Engineer W. J. Downing; Iowa, Capt. J. Raleigh, Engineer J. Buschman; Georgia, Capt. E. Carus, Engineer A. J. Smith; Sheboygan, Capt. J. Munger, Engineer F. Neidert; Chicago, Capt. C. Bronson, Engineer Thos. Dorey. Tug—Arctic, Capt. C. Thayer, Engineer G. German-son.

Union Transit Co., H. C. French, Mgr., Buffalo: Steamers—J. M. Nicol, Capt. Wm. McLean, Engineer Geo. Tretheway; Eber Ward, Capt. John L. McIntosh, Engineer John R. Judge; Avon, Capt. Norman McGuire, Engineer Jas. Countryman; Wm. H. Stevens, Capt. Alex. Clark, Engineer J. E. McSweeney; Portage, Capt. John Tyrney, Engineer Geo. W. Haig; Fisk, Capt. John Pearson, Engineer ———.

Richardson, W. C., Cleveland: Steamers—J. H. Wade, Capt. Richard Call, Engineer George McMonagle; Wm. Chisholm, Capt. Chas. R. Cleveland, Engineer Silas H. Hunter; J. H. Devereux, Capt. Jno. H. Babbitt, Engineer Thos. Shannon; J. H. Farwell, Capt. C. E. Sayre, Engineer John Johnson; Iroquois, Capt. Thos. Jones, Engineer E. W. Prince.

Parker & Millen, Detroit: Steamers—City of Toledo, Capt. Archie Fletcher, Engineer Edward Haycock; Greyhound, Capt. Bert S. Baker, Engineer Robt. Meddler; B. W. Blanchard, Capt. Thos. Meiklehem, Engineer John Bloome. Wrecking Steamers—Favorite, Capt. Martin Swain, Engineer Groh Simmons; Saginaw, Capt. Isaac Watt, Engineer L. Cronk.

Lehigh Valley Trans. Co., Buffalo: Steamers—Tuscarora, Capt. William Williams; E. P. Wilbur, Capt. P. McFarlane; Seneca, Capt. D. Driscoll; Saranac, Capt. J. M. Todd; Tacoma, Capt. C. E. Fuller; Oceanica, Capt. James Todd; Clyde, Capt. Stephen Lyons; Fred Mercur, Capt. William F. Delaney; H. E. Packer, Capt. J. A. Whiteside.

Parker, A. A., Detroit: Steamers—A. A. Parker, Capt. J. T. Hutton, Engineer M. J. Gilligan; John Oades, Capt. Timese Lemay, Engineer Harry Merrill; J. Pridgeon, Jr., Capt. D. N. Sherwood, Engineer John Mogan. Schooners—Red Wing, Capt. Chas. Anderson; Saveland, Capt. Henry Morey; B. W. Parker, Capt. Edward Lohr.

Millen, J. W., Detroit: Steamers, Iron King, Capt. Wm. V. Millen, Engineer Chris Howard; Iron Chief, Capt. W. A. Irvine, Engineer August Cobo; Iron Duke, Capt. N. L. Miner, Engineer Jno. M. Cronen-weth; Iron Age, Capt. John McAlpine, Engineer John W. Deitsch. Schooner—Iron Queen, Capt. Gus E. Atkinson.

Hepburn, A. W., Picton, Ont.: Steamers—Alexandria, Capt. E. B. Smith, Engineer Chas. McWilliams; Aberdeen, Capt. M. Heffernan, Engineer Frank Theriault; Water Lily, Capt. M. Hicks, Engineer George Gerow. Schooners—Rob Roy, Capt. Homer Peron; Delaware, Capt. ———.

McBrier, James, Erie, Pa.: Steamers—Fedora, Capt. F. A. Fick, Engineer J. J. Stevens; Nyanza, Capt. W. W. Wilkins, Engineer M. McAuliff; Uganda, Capt. C. H. Wilson, Engineer C. S. Davis; Sevona, Capt. D. L. McDonald, Engineer William Phillipee.

Robinson, C. M., Cheboygan, Mich.: Steamers—C. B. Strohn, Capt. Albert Todd, Engineer John McCarter; Clayt, Capt. Sam Corrow, Engineer John Nighthall; Cygnet, Capt. Geo. Wallas, Engineer Jim Smith.

Richardson, W. C., Cleveland, managing Richardson Transportation Co.: Steamer—Roumania, Capt. Lewis W. Stone, Engineer Martin Burns. Schooner—John J. Barlum, Capt. John McKeighan.

Richardson, W. C., Cleveland, representing Valentine Fries of Milan, O.: Steamer—William Edwards, Capt. Jas. LaFramboise, Engineer Moses Blondin. Schooner—Golden Age, Capt. D. H. Stalker.

Richardson, W. C., Cleveland, representing Owen Line: Steamers—Parks Foster, Capt. E. J. Burke, Engineer A. C. Bowen; Ira H. Owen, Capt. D. J. Duncanson, Engineer Hugh Buchanan.

Richardson, W. C., Cleveland, managing Jackson Transit Co.: Steamer—Samuel Mitchell, Capt. Thos. Wilford, Engineer Jas. Falconer. Schooner—Chickamauga, Capt. H. W. Phillips.

Merryman, A. C., Marinette, Wis.: Steamers—Menominee River, Capt. Joseph Carrigan, Engineer Charles Emson. Schooner—S. W. Wood, Capt. Thos. L. Turnbull.

Chrysler, W. E., Harbor Springs, Mich.: Steamers—Hazel, Capt. W. E. Chrysler, Engineer Patrick Crossen; Adrienne, Capt. ———, Engineer ———.

Pennington, B. L., Cleveland: Steamers—C. B. Lockwood, Capt. R. Jollie, Engineer Chas. Stoeber; Geo. Spencer, Capt. F. B. Powell, Engineer Adam Haag. Schooner, Capt. H. L. Savage.

Slyfield, A. B., Port Huron, Mich.: Steamer—White Star, Capt. A. B. Slyfield, Engineer ———. Schooner—Eva S. Robinson, Capt. L. L. Slyfield.

Ralph & Co., P. J., Detroit: Steamer—S. J. Macy, Capt. M. N. Gotham, Engineer W. F. Gregory. Schooner—Mabel Wilson, Capt. J. E. Gotham.

Lake Ontario Nav. Co., Ltd., A. W. Hepburn, Mgr, Picton, Ont.: Steamer—Argyle, Capt. G. O'Brien, Engineer John Hayelette.

Kelly Island Lime & Transport Co., Cleveland: Steamer—A. Y. Gowen, Capt. C. Smith, Engineer C. C. Smith.

Fairgrieve & Co., J. B., Hamilton, Ont.: Steamer—Arabia, Capt. Oliver Patenaude, Engineer Wm. Harwood.

Case, F. B., Norwalk, O.: Steamer—J. C. Lockwood, Capt. J. D. Peterson, Engineer F. P. Fitzgerald.

Burdick, Leander, Toledo, O.: Steamer—Panther, Capt. A. W. Stalker, Engineer Chas. J. Church.

Farwell, J. H., Detroit: Steamer—Jesse H. Farwell, Capt. C. E. Sayre, Engineer John Johnson.

Drieske & Co., Wm., Chicago: Schooner—Ralph Campbell, Capt. Peter Hanson.

PROPOSED INSURANCE AGAINST GRAIN SHORTAGES.

Editor Marine Review:—Your Buffalo correspondent in reporting certain phases of the meeting of the Laks Carriers' bill of lading committee and other interests at Buffalo, has, inadvertently probably, outlined our proposition regarding the grain storage question in a manner somewhat different than contemplated by its authors. It may interest your readers to know exactly what the proposition is.

We propose first to organize a thorough system of inspection of weights at all grain shipping and receiving ports on the chain of the lakes; second, to guarantee vessels against shortage in excess of one-quarter bushel to each 1,000 bushels carried; third, for our services and guarantee we propose to charge vessels on all grain, excepting wheat, 25 cents, and on wheat 30 cents per 1,000 bushels from all ports to Buffalo, Erie, Fairport and Toledo; from all ports to all other ports not here specified, on all grain excepting wheat, 30 cents, and on wheat 35 cents per 1,000 bushels.

In submitting the matter for the consideration of the bill of lading committee, we acted simply with a view, in case they failed to get a shortage liability clause inserted in the proposed new bill of lading, to have them recommend to the members of the association our proposition as a substitute for such clause, and a remedy for the present inequalities in the outturn of grain cargoes. We stated to the members of this committee that in order to succeed it would be necessary to have contracts with 80 per cent. of the grain tonnage on the great lakes, and as the time was short, an investigation by them would greatly facilitate matters.

In no way was it suggested at Buffalo that the proposition was weak, as is mentioned by your correspondent, and on the contrary, each member of the bill of lading committee at Buffalo, speaking for himself, expressed a favorable opinion of our proposition, but the general opinion was that it would be inopportune to endorse our proposition, pending a settlement of the entire bill of lading controversy. We have sufficient capital guaranteed to insure our ability to carry out our contracts, and unless it becomes positively apparent that vessels' interests desire to continue the present method, we shall continue to work out the proposition.

CHARLES H. THORNTON,
H. G. ERHART.

Duluth, Minn., Mar. 16, 1899.

[The reference in Buffalo correspondence to this insurance proposition being weak was made in the meetings of vessel owners, which were held within closed doors, and at which neither of these gentlemen were present. The Review is not disposed to throw cold water on anything of this kind, but it must be plain to anyone who understands the subject fully that the problem involved questions that were not met by the Duluth proposition and could be taken up only by members of the association as individuals. In this it was decidedly weak as regards to usefulness at the Buffalo conference. Nothing was said on the score of the scheme being eventually worked out with vessel owners. Its weakness during the Buffalo meetings had relation to the fact that neither the grain bill of lading committee nor the Lake Carriers' Association as an organization had any right to act for members of the association in a matter of this kind.—Editor.]

QUESTION OF LIFE-SAVING APPLIANCES.

Editor Marine Review: The Society of Naval Architects and Marine Engineers at its last annual meeting called upon members to submit articles on "Life Saving at Sea," and has invited outsiders who are familiar with the subject to participate by submitting papers which will be read when they again assemble in November next. The well known ability of members of this society vouchsafes an able discussion of a subject that ought to receive the attention of those it most concerns, and it is hoped will be productive of much good.

Shipbuilding in almost every particular has steadily advanced. Designers, builders and owners have eagerly adopted such inventions and improvements as will tend to economize labor and fuel, and increase the speed of their vessels. No expense has been spared to make the cabin, stateroom and saloon fittings luxurious and attractive in the eyes of their patrons; whereas, the most important part of their equipment, the means of readily launching the boats in time of emergency, has been entirely overlooked and treated as a matter of minor importance. This is not because there are no good devices in existence but because their use entails an "outlay that will bring no immediate returns."

The loss of life attendant on the fearful catastrophies during the past season resulted very largely from the lack of these improved appliances. If the law governing these matters was properly enforced (which it is not) the loss of life would have been greatly lessened. Not until the law is enforced will negligent owners have a proper regard for the lives of those committed to their charge.

The next meeting of the society of naval architects will be looked forward to with great interest, and this subject undoubtedly will be thoroughly discussed. But, let me ask, what result will come of it when those who are appointed and paid to enforce the law are the ones who countenance its violation on the plea that if it is enforced "some one would have a monopoly?"

With such a state of affairs, what inducement is there for inventive genius to come to the front? A discussion on how to make those entrusted with the enforcement of the laws live up to their duty, by requiring the use of devices that are in existence, until something better is produced, would, I am of the opinion, be of great value also.

SHIP MASTER.

Detroit, Mich., March 21, 1899.

Another twin-screw passenger and freight steamer for the Hamburg-American line, the Patricia, has been launched at Stettin, and is rapidly approaching completion. She is 560 feet long and 62 feet beam. Fully laden she has a displacement which exceeds the Kaiser Wilhelm der Grosse by 3,200 tons, while the latter, on the other hand, is 65 feet longer and 4 feet wider. In measurement the Patricia is about 13,000 tons register. She has a double bottom, extending the whole length of the ship, in twenty-four compartments. The vessel has accommodations for 205 first and 126 second-class passengers and 1,000 in the steerage. The cargo capacity is 12,500 tons, exclusive of bunkers. She is to make 12½ knots.

MARCH OF PROGRESS.

IT IS AT AN EXCEEDINGLY RAPID RATE IN THE SHIP BUILDING WORLD.—
NEW CONTRACTS REPORTED ON EVERY HAND.

Clinton H. Crane, yacht designer of New York City, has his hands full superintending the construction of yachts at the yard of the George Lawley & Son Corporation, East Boston, Mass., and other ship building plants. One of the steam yachts under his supervision is for A. C. Janes, and will be 160 feet over all, 130 feet water line, 26 feet 9 inches beam, and 14 feet depth. The other is for Thomas W. Lawson of Boston and is 166 feet over all, 148 feet water line, 23 feet beam and 10 feet draught.

H. M. Bean, Camden (Me.) ship builder, writes the Review that the vessel now building at his yard is for Capt. Clarence Birdsall of Tom's River, N. J. She is all timbered out and will be launched early in June. Mr. Bean already has two other contracts booked ahead. One is for a five-masted schooner for Capt. Potter of New York City and the other is for a four-masted schooner for Capt. Bailey of New Jersey. The former will be launched early in October and the latter at a later date in the same month.

The Elizabeth Marine Ways Co. of Elizabeth, Pa., has just closed contracts with the Pittsburg Plate Glass Co. for two sand dredgeboats and with Maj. W. H. Bixby, United States engineer at Louisville, Ky., for two large scows. The company also has the contract for the tug for the Pittsburg Transportation Co. It will be 210 feet long and 52 feet beam, and will be fitted with engines manufactured by the McConnell Engine Co. of Marietta, O.

It is now announced that the Union Iron Works, San Francisco, Cal., has secured the contract for the two steamers to be built for the American-Hawaiian Steam Navigation Co., mention of which was made in the last issue of the Review. The vessels will be 410 feet long, 51 feet beam and 37 feet depth, with engines of 2,500 horse power and a cargo carrying capacity of 8,500 tons. One is to be turned out in April, 1900, and the other at a later date.

The United States government has awarded to the R. M. Spedden Co. of Baltimore the contract for the steel dispatch boat for the use on the Patapsco river by the quartermaster's department of the United States army stationed at Fort McHenry. She will be 90 feet in length, 18 feet beam, 10 feet depth of hold and driven by a compound engine with cylinders of 12 and 24 inches diameter. The bid of the Spedden company was \$26,797.

The New England Ship Building Co. of Bath, Me., which recently closed a contract to build a 230 foot schooner for Whitman Chase, Jr., and others of Taunton, Mass., is rushing work on the five barges building for the Consolidation Coal Co. of Baltimore. One of the barges is in frame and the material is on hand for all the others, so that there is little doubt that all will be launched during May.

It is stated that the Maryland Steel Co. of Sparrow's Point, Md., will purchase a great quantity of new machinery to facilitate the construction of the steel floating dry dock to be stationed at Algiers, La., for which they were recently awarded the contract by the United States government. In all probability, also, additional sheds will be erected to accommodate the increased force of workmen.

S. S. Bailey, a well known mining man, will have a steamer, to be known as the Bailey, built at Bennett City, Wash. The machinery is being supplied by the Summers Iron works, Everett, Wash. The Bailey will be 110 feet in length, 22 feet beam and 4½ feet depth of hold and will cost when completed about \$30,000.

The steel sailing ship Arthur Sewall, recently launched at the yard of Sewall & Co., Bath, Me., will be ready to leave the yard within a few days. It is now announced that Sewall & Co. will in the near future begin the construction of two instead of a single steel sailing ship.

The New River Navigation Co., organized for the purpose of owning and operating steamboats, has been incorporated with principal office at Hinton, W. Va. Stockholders include R. H. Smith, J. Hugh Miller, J. Frank Smith, J. G. Haley and L. M. Peck, all of Hinton.

Le Barron H. Jenkins is constructing at his ship yard off Condor street, East Boston, a tug for Capt. Joseph Ross. The vessel will be 58 feet over all, 14½ feet beam and 6½ feet depth and will be fitted with a single high-pressure engine with 12x12 inch cylinder.

The Boston Spar Co., whose yard is on Condor street, East Boston, Mass., is making the spars for the cup defender yacht building by the Herreshoffs. The contract calls for the completion of the work by April 1.

The Atlantic Works, East Boston, Mass., which is at present at work on the tugs Boxer and Teaser, will shortly lay the keel for another tug for the Union Towboat Co. of Boston. She will measure 86 feet keel.

The Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, of Morris Heights, N. Y., announce that the steam yacht which they are building for Dr. F. L. Humphreys will be known as the Cayuga.

Jacob S. Ellis & Son, Tottenville, S. I., is building a 72-foot tug for the Red Star Towing line. The engine, 16x18 inches, will be furnished by M. Elssor of New York and the boiler by Heipershausen Bros.

The Fulton Engine & Ship Building Works, San Francisco, has secured at \$4,600 the contract for furnishing a steam launch for use at the San Diego barracks, Cal.

Samuel Ayers & Son, Nyack, N. Y., announce that they have about completed work on the handsome yacht building for Rev. Thomas Dixon of Brooklyn, N. Y.

The American Hoisting & Derrick Co. of Chicago is installing a 5-ton movable derrick at the ship yard of the Pusey & Jones Co., Wilmington, Del.

Hall Bros., Port Blakely, Wash., announce that the two four-masted schooners which they have under construction will be ready for launching about July 1.

Mayor M. R. Brown of Crookston, Minn., is building a small steamer that will ply upon the waters of Cass Lake, Minn., during the summer season.

C. G. Davis designed the 48-foot auxiliary sloop yacht to be built by Samuel Ayers & Son, Nyack, N. Y., for Malcolm Graham, Jr.

The Charles Hedgewald Co., New Albany, Ind., has secured a \$50,000 contract for the machinery for four large towboats.

Gardner & Cox of No. 1 Broadway, New York, will draw up plans for a twin-screw steamer for service in Delaware bay.

Fred T. Davis of Gloucester, Mass., has contracted with Tarr & James, Essex, Mass., for a schooner of 108 tons.

Capt. E. W. Wilder of Clinton, Mass., is building a small vessel for Arthur Rogers of East Dennis, Mass.

Peter Magee of Athens, N. Y., is building a 95-foot tug for C. E. Evarts & Co. of New York City.

The Jackson & Sharpe Co., Wilmington, Del., will build a wooden tug for New York parties.

The Daily Towing Line is having a tug built at South Brooklyn, foot of Twenty-fifth street.

The Union Iron Works, San Francisco, will, it is understood, undertake repairs on the battleship Iowa. The vessel was to have gone to the Mare Island navy yard, but it has been decided that she cannot get to the yard without much inconvenience. The draught of the Iowa is greater than the depth of the approach to the establishment at Vallejo, and it was pointed out to the secretary of the navy that the vessel would have to pass through and remain in the mud for a long period after she was ordered to Mare Island, and that this would be at a sacrifice of the efficiency of the condensers, pumps and under-water valves, which would be choked with the sediment. The ship was damaged on her voyage to San Francisco from the North Atlantic, and the repairs will consume a good deal of time.

There is evidently to be no delay in the completion of the new dry dock at the yard of the Newport News Ship Building & Dry Dock Co., at Newport News, Va. Over 200 men are now employed in the work of excavation, and in operation regularly are five shovels, each with a capacity of two cubic yards of earth. The dirt is being utilized in the making of new land in the northern part of the yard. The timber to be used in the construction of the dock has already begun to arrive. It comes principally from Georgia and Florida, about 5,000,000 feet will be required.

A final order of sale in the case of H. W. Putman and C. J. Hall, trustees, against the Pennsylvania & Ohio Fuel Co. and the Turney & Jones Co. has been entered in the United States circuit court at Chicago. The lake coal docks are to be sold April 1, while the mines are to be sold soon after. The docks are at Duluth, Ashland and Manitowoc, Wis., and the mines are near Columbus, O. This whole matter of litigation is, of course, intended for a reorganization of these coal interests.

A small ice-making machine, suited to vessels of the larger class engaged in freight traffic on the great lakes, is being made by the Automatic Refrigerating Co. of 972 Hamilton street, Cleveland. One of the machines will probably be placed aboard the steamer Presque Isle about May 1. Refrigerating plants are a necessity on passenger steamers engaged on long runs, but the idea of developing a small machine that might be used at low cost on freight vessels is new.

Two St. Louis electricians have the latest thing in the way of a radical invention and will present its claims to the light-house board at Washington. They propose to substitute for the whistling buoy and the bell buoy, which are automatic in their workings, a buoy containing a monster phonograph. The fog signals, both steam and bell, are to be discarded, according to the new scheme, and the phonographs, worked by weight or steam, are to supplant them.

The Welland canal size steel steamer to be put down by the Craig Ship Building Co. at Toledo immediately after the launch of the steel steamer now building for Miller, Bull & Knowlton of New York will be used by the Porto Rico Steamship Co. as a package freighter in trade around Cuba and Porto Rico. The vessel is to be delivered in six months. She will be 220 feet keel, 32 feet beam and 13 feet hold.

Mr. Robert W. Hunt of Chicago, who has been employed as an engineer expert in the work of forming several of the big industrial combinations of late, is now engaged in going over the works of the bridge builders of the country, who have consolidation plans under way.

It is understood that the steamer Osceola has been chartered for the coming season to the Lake Michigan & Lake Superior Transportation Co. of Chicago, and that the steamer Wyoming has been secured for the line operating between Port Huron and the head of Lake Superior.

The Bourne-Fuller Co. of Cleveland, dealers in iron and steel, have distributed among their patrons a very handsome souvenir in the form of a neat paper knife—an always acceptable present.

The large steamship building at Belfast for the Dominion Line for service between Liverpool and Boston will not be ready for service before next year. The boat will be 600 feet long.

A visit to the national capital may be enjoyed without extra cost for fare in going to Philadelphia and New York over Pennsylvania short lines. Tickets to those point via Washington may be obtained at same fares as apply over Pennsylvania direct lines, and will be good for ten days' sojourn at the national capital. For particular information apply to Pennsylvania lines ticket agents or address C. L. Kimball, assistant general passenger agent, Cleveland.

THE NEW GERMAN BATTLESHIPS.

The programme adopted for the increase of the German fleet provides for three battleships being laid down this year and two in 1900. They are to be of the new type introduced with the Kaiser Friedrich III., recently completed at Wilhelmshaven. Four other ships of the class are in hand—the Kaiser William II., to be completed in the spring, Ersatz König Wilhelm, 1901, and the two vessels A and B provided for last year to be ready in 1902. Great defensive and offensive power have been worked into their displacement of 11,080 tons. The curved armor deck (2.5 inches thick) protects the boiler and engine rooms, the magazine and torpedo chamber, and the steam steering apparatus, and is thickened to 3 inches at the stern, to which, for a fifth of the ship's length, the armor belt does not extend. The water-tight subdivision below the deck is extensive, and is described as inconvenient, and a cofferdam filled with coke at the waterline is another element of safety. The side armor of Krupp steel, and 30 per cent stronger than the nickel steel of the Brandenburg class, is 6 feet 6 inches high, and from 12 inches to 6 inches thick. The turrets have 10-inch and the casemates 6-inch plating. The whole of the guns are to be on the quick-firing principle, and include four of the new long Krupp 9.4-inch 40-calibre guns, coupled in the turrets. The machinery consists of three triple-expansion vertical engines, together of 13,000 indicated H. P., each having a screw, to give a speed of 18 knots. The auxiliary machines in the new ships number nearly 100. The coal capacity is 650 to 1,000 tons.

ONE LONG WHISTLE OR FOUR BELLS.

THESE ARE THE ONLY SIGNALS TO BE USED WHEN IT IS DESIRED TO HAVE THE ENGINE BACKED STRONG—REPETITION OF THE TWO-WHISTLE SIGNAL IS A VIOLATION OF THE LAW.

James A. Dumont, supervising inspector-general of steam vessels, has answered very clearly the letter from Pickands, Mather & Co. of Cleveland, printed in the last issue of the Review, and in which information was requested regarding the signals to be used between pilot house and engine room when the engine is backing and when it is desired to back stronger. This subject was brought up at a meeting of some twenty-five chief engineers employed by the Cleveland firm. General Dumont says:

Messrs. Pickands, Mather & Co., Cleveland—Gentlemen: I am in receipt of your favor of the 14th inst. relating to whistle signals between pilots and engineers on steamers on the great lakes, and referring to an alleged custom therein, "when the master desired the engine to be backed strong to repeat the backing signal of two whistles." Referring also to the statement of one of your engineers, that I "have stated when the two whistle signal is repeated it can only be interpreted to mean reverse your engine and work her in the opposite direction, and that in the event of the master desiring the engine worked stronger, he must, irrespective of whether she is going ahead or backing, use the one long-whistle signal." I also note what you say in regard to the opinion of your employees, who seem to think that under such ruling as above quoted "there is liable to be more mistakes between the master and engineer than there would be under the custom which they have been following."

In reply, would say in regard to this last quoted statement, that the only case coming under my notice of an accident happening or damage being done, was in blowing two whistles to back strong when the engine at the time was already backing under a two-whistle signal; and it was this case that called out the remarks as stated to you by one of your engineers, which I have already quoted herein.

The question was brought before the board of supervising inspectors, verbally and informally, at the board's recent meeting, by the engineer who caused the accident referred to, and who had been censured and held at fault for an alleged misconstruction of the meaning of the whistle signals, his object apparently being to obtain the board's support of his action. The matter was freely but informally discussed by the board, when all the members but one agreed that the engineer was at fault, and that his duty was, when backing under two whistles and he received another two whistles, to "stop, reverse his engine, and go ahead."

The board of supervising inspectors subsequently visited, upon invitation, the National Association of Marine Engineers, then in session in Washington, for mutual conference, when the same engineer, who was a delegate, brought the subject up there, and the matter was again discussed, with the result that his associates were almost, if not quite, unanimous against his construction of the rule.

This matter may be better understood by a consideration of the rules themselves, which read as follows: "There shall be used between the master or pilot and engineer the following code of signals, to be made by bell or whistle, namely: 1 whistle or bell, go ahead; 1 whistle or bell, stop; 2 whistles or bells, back; 3 whistles or bells, check; 1 long whistle or 4 bells, strong; 1 long whistle or 4 bells, all right; 2 whistles or two bells, when the engine is working ahead will always be a signal to stop and back strong."

From the above it will be clearly seen, I think, that when a steamer's engine is at rest the signal for backing is two whistles, and the same whistles given when the vessel's engine is going ahead means to "stop and back strong;" and then, if emphasis is desired to be given such a signal, the rule provides another absolute signal, namely, "one long whistle or four bells," which is the only signal authorized by the rules under the conditions given. The rule for going ahead, as will be seen, is one whistle or bell; the same signal is used for stopping, whether going ahead or going astern. Consequently, the rules having provided, first, that "two whistles" means to back, and second, "one long whistle or four bells" to back strong, it follows that when a steamer is backing and the engineer receives two bells, it can only mean that one of the bells means stop backing and the other bell to go ahead. Had the engineer who brought this subject to my attention and that of the board of supervising inspectors followed the rule as here laid down, there would have been no collision, the vessel in which he was in charge of the engine having at the time a danger to confront both ahead and astern, and no leeway between, that would permit an interval between the last two whistles blown by the

master, a condition frequently happening to a vessel when entering or leaving a crowded harbor, or navigating in a crowded river, and I speak of this from long personal experience.

In respect to your statement, that it "often happens that the captain having to use a good many whistle signals in docking his ship may possibly forget the last signal that was given to his engineer, and they have guarded against this by only giving the two-whistle signal one interpretation," I would suggest, in regard to the last clause of this statement, that instead of the captain giving the two-whistle signal one interpretation, he has, as heretofore explained, given it two interpretations, one of them in direct violation of the rules, when he reports a two-whistle signal for a strong movement of the engines when the lawful signal for such purpose, as given in the rule of the board of supervising inspectors, is one long whistle or four bells. I would further say that it is, in my opinion, a very dangerous practice, one which cannot be too strongly condemned, for masters, pilots or engineers to supplement the rules of the board of supervising inspectors with rules of their own which are directly contrary to those of the board, particularly if this is done, as is suggested, as a remedy for their forgetfulness of what the last signals given were.

In conclusion would say that I fully confirm the statement quoted in your letter as to my interpretation of the whistle signals, and I am glad that you have taken the subject up and will issue a circular letter in accordance therewith to your masters and engineers. Trusting you will pardon the lengthy details I have given herein explanatory of my reasons for the interpretation given the rule under consideration, I am,

J. S. A. DUMONT.

Office of Steamboat Inspection Service, Supervising Inspector General.
Washington, D. C., March 16, 1899.

TRADE NOTES.

The Roberts Water Tube Boiler Co. of Redbank, N. J., has passed the 1,000 in the number of boilers built since the company was organized.

Henry R. Worthington has received the contract for the entire equipment of pumping engines for the water supply at the Paris Exposition of 1900.

Mr. Jas. A. Myers has severed his connection with the firm of C. W. Elphicke & Co., of Chicago. Mr. H. B. Earhart, formerly of Duluth, is now with C. W. Elphicke & Co.

The Chase Machine Co. of Cleveland, is getting a share of the prevailing prosperity. An addition to the present works is being erected—20 by 114 feet. New machines to be installed include a Chisholm-Moore traveling crane.

All the new ships building at the works of the Globe company, Cleveland, the Chicago Ship Building Co. and the American Steel Barge Co., West Superior, will be provided with electrical apparatus by the General Electric Co.

The new steamer building for the Boston & Philadelphia Steamship Co. is being constructed for classification under rules of the United States Standard Register of New York. Two steamers building at Sparrow's Point, Md., are also to be classed by this society.

Orders for \$250,000 worth of machine tools have been placed by the Westinghouse Machine Co. for the addition to its East Pittsburg plant. The orders were divided principally between Bement, Miles & Co., Manning, Maxwell & Moore, Niles Tools Works Co., Wm. Sellers & Co., Pond Machine Tool Co., and the E. P. Bullard Co.

A standing notice in all the circular matter pertaining to packings sent out by the Peerless Rubber Mfg. Co. of New York, reads like this: "If your local dealer will not furnish you with the genuine Rainbow packing, or attempts to substitute an imitation as 'just as good,' write us and we will see that you get the genuine and only Rainbow packing inside of twenty-four hours."

An office has been opened at 26 South Water street, Cleveland, by Manning, Maxwell & Moore, widely-known manufacturers' agents of New York. Mr. Frank B. Ward, who will have charge of the Cleveland office, is well known to the machinery trade, having had extensive experience in that line, both as a manufacturer and as manager for other prominent houses.

The Cleveland City Forge & Iron Co. has been awarded the contract for the rudder frame for the battleship Maine, building at the Cramp yard. The forging will weigh 45,000 pounds. The Cleveland company has also secured the contract for the forged frame for the battleship Ohio, to be built at the Union Iron Works, San Francisco. The weight of this piece will be 33,000 pounds.

Any one interested in dredges or dredging will find a veritable work of art in the descriptive illustrated catalogue just issued by the Bucyrus Co. of South Milwaukee, Wis. There is a description of the new plant of the company, together with articles on the various types of dredges and excavating machinery, as well as handsome pictures of the most powerful machines turned out by these works.

The George F. Blake Manufacturing Co. has just installed a new compressed air plant at the dock of the Atlantic Works, East Boston, Mass. The outfit, which consists of a compressor weighing 7 tons, a storage tank of large capacity and resistance and a system of piping for connections with the machines to be employed, was utilized for the first time in making repairs to the steamer Admiral Dewey.

After very exhaustive tests the mechanical department of the Pennsylvania railroad company has recommended that seamless cold drawn boiler tubes, manufactured by the Shelby Steel Tube Co. of Cleveland, be utilized in the Thornycroft water tube boilers to be installed in the ferry boat Philadelphia now building for the Pennsylvania Co. at Roach's ship yard, Chester, Pa. This will be the second boat built for this company in which the use of the Shelby company's tubes has been specified.

Jenkins Bros. of New York, Boston, Philadelphia and Chicago have just issued the 1899 catalogue of their steam specialties. The Jenkins valves, discs and standard packing have all been improved while the iron body valves have been enabled to share in the general improvement by an increase in the thickness of the flanges and the addition of more bolts,

making them suitable for either high or low pressure. The catalogue is extensively illustrated and describes all the Jenkins specialties for steam, gases, water, acids or oils.

The Brown Hoisting & Conveying Machine Co. of Cleveland has begun the erection of an ore unloading and storage plant of unusual size at the works of a large furnace company at Mariupol, South Russia. The contract is worth in the neighborhood of \$500,000. Orders for machinery have recently been received from furnace companies in Antwerp, Saraing and Liege, Belgium; Valenciennes, France; Dormund and Luxemburg, Germany, and three from Vienna, Austria. The company is also shipping to London, England, two cantilever cranes valued at \$80,000.

The appellate division of the supreme court of New York State a few days ago handed down a decision in the appeal of George F. Schmid from the decision of Judge Truax granting, on Frederick L. De Grauw's application, an injunction restraining Mr. Schmid from using the name of De Grauw, Aymar & Co. in his ship chandlery business. The court's decision dissolves the injunction, and is a victory for Mr. Schmid, although the action has yet to be tried in court. Until then Mr. Schmid can continue the business at 34 and 35 South street, New York, as if the suit had never been brought.

The whole world is appreciating the application of the force of compressed air to ship building tools, as indicated by the following note in a letter from Mr. Chas. Booth, manager of the Chicago Pneumatic Tool Co.: "We have made a number of shipments to South Africa, the last one consisting of six Boyer piston air drills and four Boyer pneumatic hammers. We have also furnished a complete plant, including riveters, hammers and drills, to go to Pago Pago, Samoan islands, for use in the erection of the United States coaling station at that point. We are also shipping to South America, Australia, China and Japan."

The Geo. F. Blake Mfg. Co. reports having just shipped very large full outfits of air pumping machinery, including main and boiler feed pumps, to the Vulcan Works, Stettin, Germany, for the equipment of Japanese and Russian cruisers being built there. They hold orders for over fifty large marine pumps for both the North German Lloyd and the Hamburg-American steamship companies. French orders include 40 pumps on the Blake simplex system for two of the new liners of the Compagnie Generale Transatlantique, now building at Havre, France. The company is also constructing several pumps for the Austrian navy, and is at present negotiating with the Russian government for the equipment of some cruisers now in course of completion in Russia.

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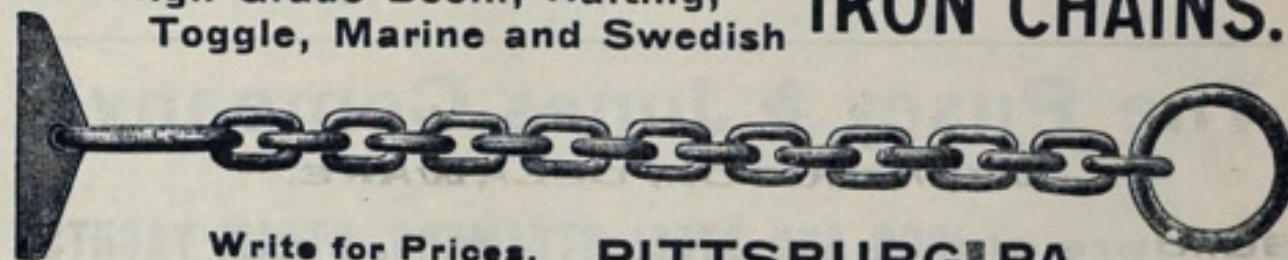
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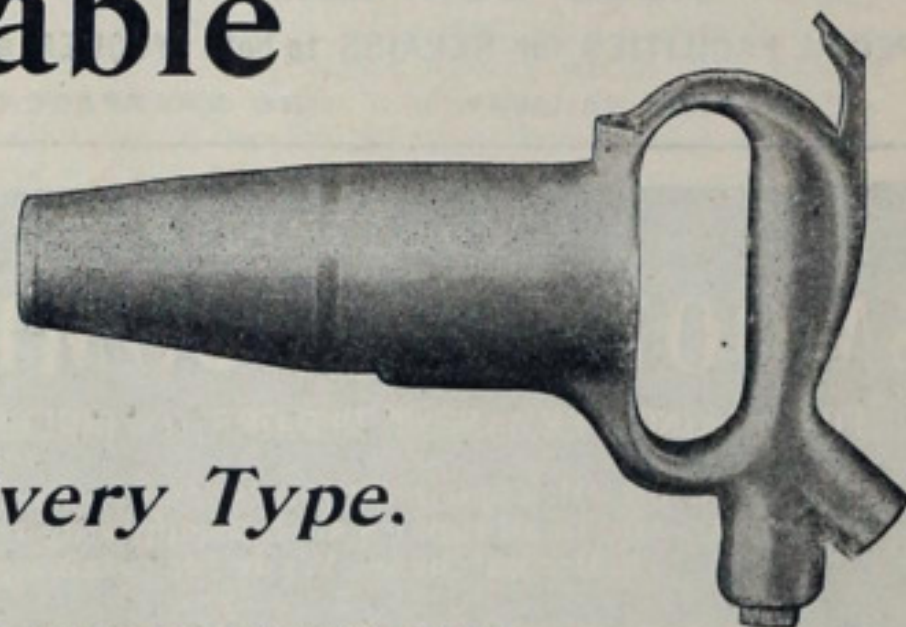


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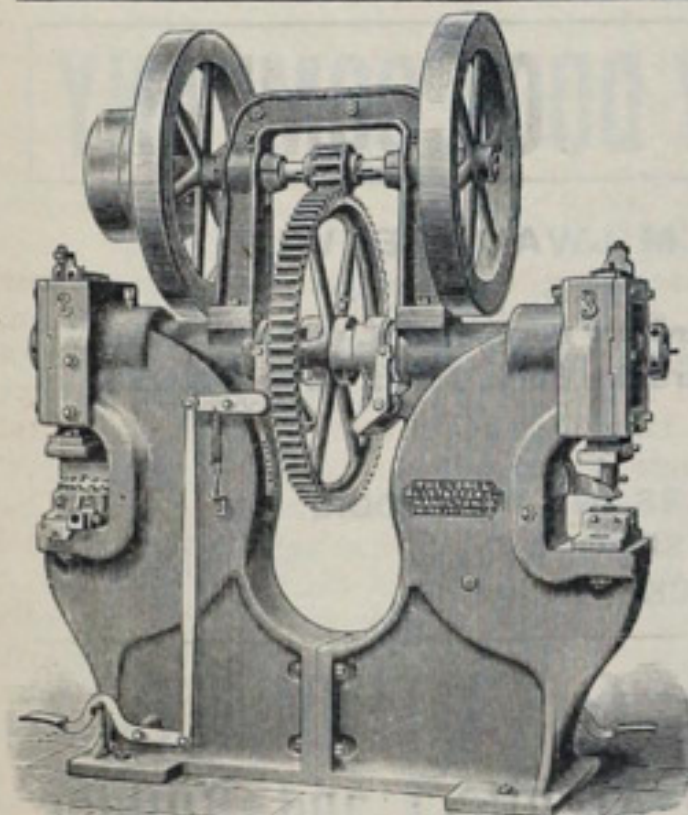
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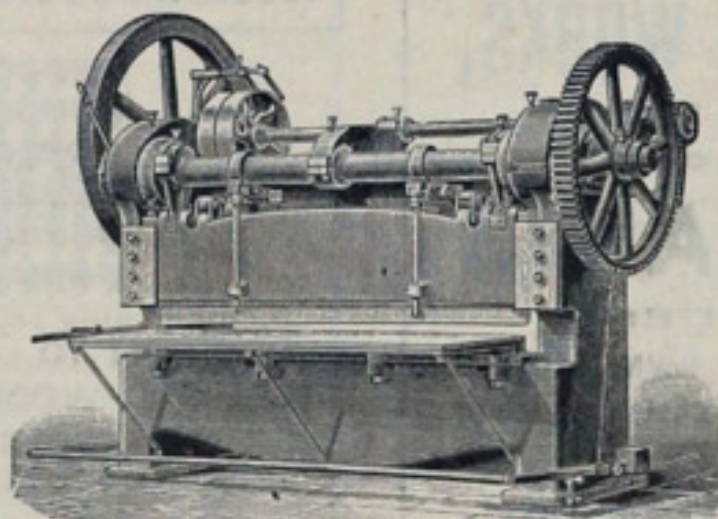
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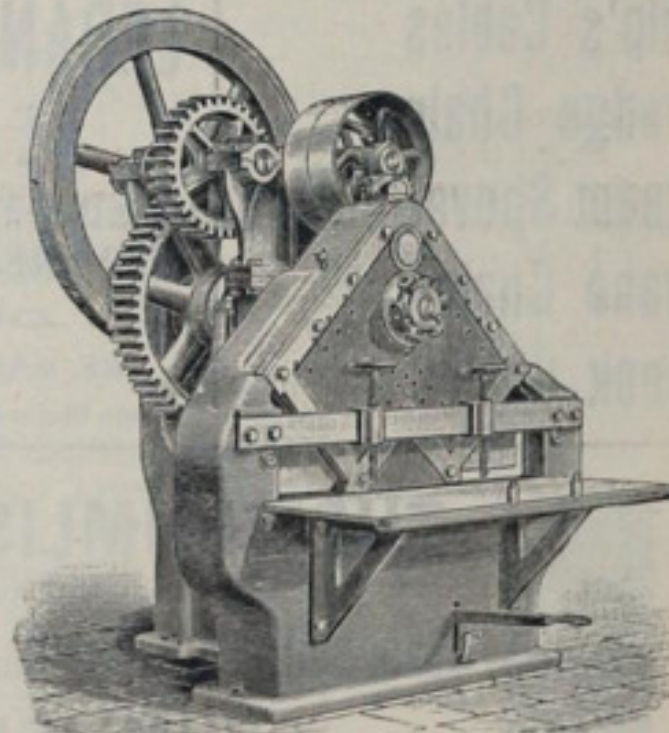
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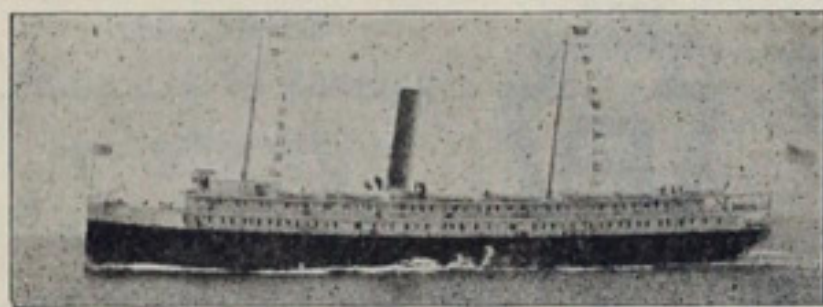


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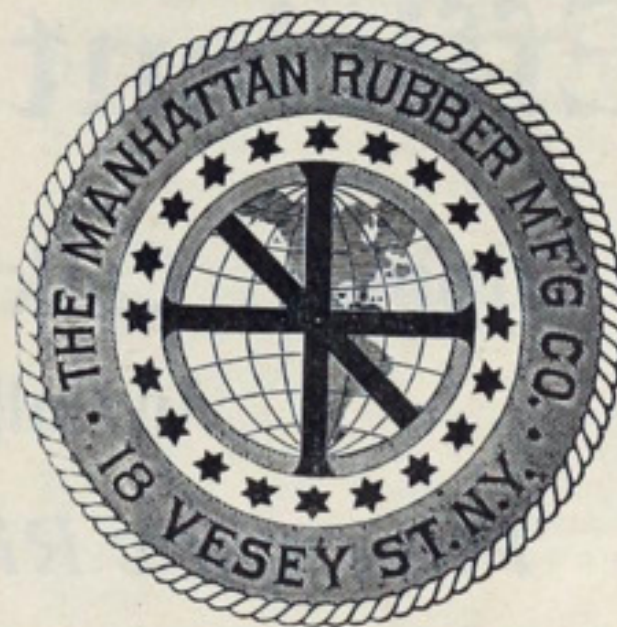
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